2024
Fall

# Trine University
# Course Catalog
# 2024 Fall

# Contents

# Calendar

**Main Campus & College of Graduate and Professional Studies (CGPS)**

****All Graduate classes, regardless of format, follow the 8-week Face to Face summer schedule as detailed in course syllabus****

| **Fall Semester 2024** | |
|---|---|
| August 19 | Classes begin |
| August 26 | Last Day to drop a course at 100% refund<br>Last day to add a course |
| September 2 | Labor Day (no classes) |
| September 9 | Last day to drop a full semester course at 50% refund |
| October 2 | Last day to drop a Term 1 online course - no refund |
| October 12 | Term 1 online ends |
| October 14-15 | Fall Break (no classes) |
| October 21 | Term 2 online begins |
| October 28 | Last day to drop a Term 2 online course at 100% refund<br>Last day to add a Term 2 online course |
| November 13 | Last day to drop a full semester long course – no refund |
| November 27-29 | Thanksgiving Break (no classes) |
| December 4 | Last day to drop a Term 2 online course – no refund |
| December 6 | Last day of classes |
| December 9-12 | Finals Week |
| December 14 | Fall Semester Ends |
| **Spring Semester 2025** | |
| January 6 | Classes Begin |
| January 13 | Last day to drop a course at 100% refund<br>Last day to add a course |
| January 20 | Martin Luther King Jr Day (no classes) |
| January 27 | Last day to drop a full semester course at 50% refund |
| February 29 | Last day to drop a Term 1 online course - no refund |
| March 1 | Term 1 online ends |
| March 3-7 | Spring Break (no classes) |
| March 10 | Term 2 online begins |
| March 17 | Last day to drop a Term 2 online course at 100% refund<br>Last day to add a Term 2 online course |
| April 9 | Last day to drop a full semester course - no refund |

| | |
|---|---|
| April 18 | Good Friday (no classes) |
| April 23 | Last day to drop a Term 2 on line course - no refund |
| April 25 | Last class day |
| April 28-May 2 | Finals Week |
| May 3 | Spring Semester Ends |
| May 3 | Commencement |
| **Summer Semester 2025** | |
| May 12 | Classes begin - 12-Week, First 6-Weeks, Term 1 online |
| May 16 | Last day to drop a course at 100% refund<br>Last day to add a course |
| May 26 | Memorial Day (no classes) |
| June 13 | Last day to drop a course (First 6-Weeks) - no refund |
| June 19 | Last Class Day - First 6-Weeks |
| June 20 | Finals - First 6-Weeks<br>No 12-Week Classes |
| June 21 | Term 1 online ends |
| June 23 | Classes begin - Second 6-Weeks and Term 2 online |
| June 27 | Last day to drop a course at 100% refund (Second 6-Weeks) |
| July 4 | July 4th Holiday Observed (no classes) |
| July 18 | Last day to drop a course (12-Week) - no refund |
| July 25 | Last day to drop a course (Second 6-Weeks) - no refund |
| July 31 | Last Class Day - 12-Week and Second 6-Weeks |
| August 1-2 | Finals - 12-Week and Second 6-Weeks |
| August 2 | Term 2 online ends |
| August 2 | Summer Semester Ends |

# President's Welcome Message

Dear Trine Student,

Welcome to the Trine University family! It is our mission to promote your intellectual and personal development through professionally focused and formative learning opportunities, preparing you to succeed, lead and serve. With an educational heritage spanning nearly 140 years, we have taught generations of successful learners and plan to do so for years to come.

Our expectations for academic excellence will serve you well, even before you graduate, as many of you will find jobs and internships with companies who know our reputation. After graduation, you will find that having Trine University on your resume will carry immense clout with employers. More than 1,900 respected businesses, companies, and organizations around the world seek out our graduates because of the quality of a Trine education.

Our job-placement numbers speak for themselves. We have consistently placed more than 99 percent of our graduates in graduate school or found meaningful employment within six months of graduation. Our graduates also go on to pursue doctorates at schools such as Yale, Stanford, University of Michigan and Case Western.

In the last decade we have experienced transformative changes. These changes will continue because of the vision of our administration, faculty, staff, trustees, community and – most importantly – you. We focus on your future. You are our most valuable asset and, quite frankly, the reason we're here.

Your professors will expect active participation, collaboration, theoretical study, and creativity. We are giving you the tools – quality teaching, labs, resources, technology, support – to be successful in your college career and beyond. It's up to you to use them. We believe in you and look forward to the day we receive word that you got your dream job or were accepted to graduate school.

That's why we're here – to help prepare you to succeed, lead, and serve.

Please feel free to stop by my office anytime. My door is always open.

Sincerely,

Earl D. Brooks II, Ph.D.
President
Trine University

# Trine University Profile

**Disclaimer**

The information contained in this catalog is subject to change. It is the responsibility of the student to ensure that information, particularly in regard to fees, is current. Up-to-date information is available through academic advisors or on the Trine University Web site at trine.edu.

**Description**

Trine University is a private, comprehensive, career-oriented, degree granting institution. It offers degrees from associate to the doctorial level through six schools—Allen School of Engineering and Computing, Franks School of Education, Jannen School of Arts and Sciences, Ketner School of Business, Rinker-Ross School of Health Sciences, College of Health Professions, and the College of Graduate and Professional Studies/TrineOnline (CGPS). The University is governed by a self-perpetuating Board of Trustees.

**Mission Statement**

Trine University promotes intellectual and personal development through professionally focused and formative learning opportunities, preparing students to succeed, lead and serve.

**Vision**

Trine University will be recognized as a premier university, characterized as engaged, dynamic, growing, and adding value.

-Adopted on May 7, 1999 and revised April 30, 2004, September 2006, and October 2010

**Corporate Status**

Trine University is an educational corporation organized and existing under the laws of the state of Indiana. The correct corporate name of the institution is Trine University, Incorporated. The University was founded in 1884 as Tri-State Normal College. The governing body of the University is the Board of Trustees, which has an authorized membership of 27 trustees, each of whom serves without compensation and none of whom may be employed by the University in any administrative or teaching capacity. Two of the trustees are authorized to be elected by the alumni. Consistent with this form of organization and non-profit operation, Trine University has been granted exemption from federal income tax by the Commissioner of Internal Revenue, Treasury Department under Section 501 (c) (3) of the Internal Revenue Code. Contributions to the University are deductible to the extent provided by law; bequests, legacies, devises or transfers to the University are deductible in arriving at the value of the net estate of a decedent for estate tax purposes in the manner and to the extent provided by law; gifts of property are deductible in computing net gift for gift tax purposes in the manner and to the extent provided by the Internal Revenue Code.

## Accreditation

### Higher Learning Commission

Trine University is accredited by the **Higher Learning Commission** (*www.hlcommission.org*), an institutional accreditation agency recognized by the U.S. Department of Education. Telephone 312.263.0456. By Indiana law, Trine is an "approved postsecondary educational institution" under Indiana code 1C 21-7-13-6. Indiana Commission for Higher Education, *www.che.in.gov.* In accordance with the assumed practices of the Higher Learning Commission, the minimum program length for associate degrees is 60 semester credits. For bachelor's degrees the minimum is 120 semester credits, and for master's degrees it is 30 semester credits beyond the bachelor's degree. Further, Trine University deigns the minimum program length for minors as 15 semester credit hours.

**Engineering Accreditation Commission of ABET**

Trine University's programs in biomedical engineering, chemical engineering, civil engineering, computer engineering, electrical engineering, and mechanical engineering (as delivered on the main campus) are accredited by the **Engineering Accreditation Commission of ABET**, *www.abet.org*. Other engineering programs are not accredited by ABET.

**Council for the Accreditation of Educator Preparation (CAEP**

All teacher preparation programs are accredited by the **Council for the Accreditation of Educator Preparation (CAEP)** http://caepnet.org and the **Department of Education/Office for Education Development (DOE/OELD)** *www.doe.in.gov/licensing.*

**Accreditation Council for Business Schools and Programs (ACBSP)**

All BSBA degrees offered by the Ketner School of Business and the College of Graduate and Professional Studies are accredited by the **Accreditation Council for Business Schools and Programs (ACBSP)**, *www.acbsp.org*. Accredited majors include accounting, applied management, business administration, finance, golf management, human resource management, management, marketing, and sport management. Associate degree programs in accounting and business administration are also accredited.

**Commission on Accreditation of Allied Health Education Programs (CAAHEP)**

Trine University's Surgical Technology Program is accredited by the **Commission on Accreditation of Allied Health Education Programs (CAAHEP)**, 9355 113th St N, #7709, Seminole, FL 33775; telephone: 727-210-2350; website: www.caahep.org, in cooperation with the **Accreditation Review Council on Education in Surgical Technology and Surgical Assisting (ARCSTSA)**, 6 West Dry Creek Circle, Suite 110, Littleton, CO 80120; telephone: 303-694-9262; website: www.arcstsa.org/.

**Commission on Collegiate Nursing Education**

The RN-BSN program at Trine University is accredited by the **Commission on Collegiate Nursing Education**; website: www.ccneaccreditation.org.

**Commission on Accreditation in Physical Therapy Education (CAPTE)**

The Doctor of Physical Therapy Program at Trine University is accredited by the **Commission on Accreditation in Physical Therapy Education (CAPTE)**, 3030 Potomac, Ave. Suite 100, Alexandria, Virginia 22305-3085; telephone: 703-706-3245; email: accreditation@apta.org; website: www.capteonline.org.

**Accreditation Review Commission on Education for the Physician Assistant, Inc. (ARC-PA)**

At its 2023M meeting, the **Accreditation Review Commission on Education for the Physician Assistant, Inc. (ARC-PA**) placed the Trine University Master of Physician Assistant Studies Program sponsored by Trine University on Accreditation-Probation status until its next review in 2025M.

Probation accreditation is a temporary accreditation status initially of not less than two years. However, that period may be extended by the ARC-PA for up to an additional two years if the ARC-PA finds that the program is making substantial progress toward meeting all applicable standards but requires additional time to come into full compliance. Probation accreditation status is granted, at the sole discretion of the ARC-PA, when a program holding an accreditation status of Accreditation - Provisional or Accreditation - Continued does not, in the judgment of the ARC-PA, meet the *Standards* or when the capability of the program to provide an acceptable educational experience for its students is threatened.

Once placed on probation, a program that fails to comply with accreditation requirements in a timely manner, as specified by the ARC-PA, may be scheduled for a focused site visit and is subject to having its accreditation withdrawn.

Specific questions regarding the Program and its plans should be directed to the Program Director and/or the appropriate institutional official(s).

The program's accreditation history can be viewed on the ARC-PA website at www.arc-pa.org/accreditation-history-trine-university/.

# Title IX Notice of Non-Discrimination

Trine University does not discriminate on the basis of race, color, national or ethnic origin, sex, disability, veteran status or age in the administration of any of its educational programs, admissions policies, scholarship and loan programs, athletic and other school-administered programs, or in employment. The University is required by Title IX not to discriminate in such a manner. The University has designated Jamie Norton as its Title IX coordinator, and as the person to whom questions regarding Title IX and the nondiscrimination policies should be directed. Questions regarding Title IX may also be referred to the Department of Education Office of Civil Rights. Ms. Norton may be contacted as follows:

Jamie Norton
Assistant Vice President for Human Resources
Trine University
Shambaugh Hall, Room 322
One University Avenue
Angola, Indiana 46703
260.665.4847
nortonj@trine.edu

The University has also designated the following persons as deputy Title IX coordinators to whom questions or complaints may be directed:

Francisco Ortiz
Vice President for Student Affairs
Trine University
University Center, Room 207
One University Avenue
Angola, Indiana 46703
260.665.4171 (Direct)
ortizf@trine.edu

Jacqueline Delagrange
Chair, Department of Criminal Justice
Trine University
Best Hall, Room 1151
One University Avenue
Angola, Indiana 46703
260.665.4187 (Direct)
delagrangej@trine.edu

Stephanie George
Assistant Director of Human Resources
Trine University
Shambaugh Hall, Room 322
One University Avenue
Angola, Indiana 46703
260.665.4991
georges@trine.edu

In addition, the University has designated Nicole Kibiloski as its section 504 coordinator. Ms. Kibiloski is available to respond to inquiries regarding the University's responsibilities under section 504 of the Rehabilitation Act of 1973, and may be contacted as follows:

Nicole Kibiloski
Director of Accessibility Services
Trine University
University Center, Room 227
One University Avenue
Angola, Indiana 46703
260.665.4590
kibiloskin@trine.edu

**Accessibility Statement**

All students learn differently, and it is our goal at Trine to assist students in achieving success. If a student plans to request academic accommodations, please see additional information found here: https://trine.edu/campus-life/health-wellness/accessibility-and-accommodations.aspx

**Americans with Disabilities Act (ADA) Compliance**

It is the policy of Trine University not to discriminate against qualified individuals with disabilities and to provide reasonable accommodations, as required by law, to students who may be affected by the policies set forth above. If a student believes that he or she is a qualified individual with a disability who may need a reasonable accommodation, please see additional information found here: https://trine.edu/campus-life/health-wellness/accessibility-and-accommodations.aspx

**Financial Information**

Selected financial data are available from the institution's annual report. That report may be obtained from the office of the President or of the Vice President for Finance.

**Campus Security**

A copy of the annual campus security report is available by September 1 of each year at trine.edu. It contains statistics, policies, and a description of programs that promote campus safety as well as drug prevention program information.

# Locations

**Angola Campus**

Founded in 1884 as Tri-State Normal College, Trine University main campus sits on 450 acres in the heart of Steuben County and offers traditional face-to-face undergraduate courses. Five academic schools comprise over 35 majors and 40 minors, including accredited CAEP education and ABET engineering programs.

Trine University
One University Avenue
Angola, IN 46703
trine.edu

**The College of Graduate and Professional Studies (CGPS)**

CGPS is designed to provide quality, continuous higher education learning opportunities for adults who want to advance in their careers and keep pace with the growing complexities of today's career environment.

The College of Graduate and Professional Studies serves multiple student populations:

- Domestic, non-traditional students
- International students in graduate programs
- Students at overseas global partnerships locations.

In order to meet the needs of domestic non-traditional students, classes have moved almost entirely to an online format. These students are part of CGPS's TrineOnline initiative. International graduate students holding an F1 visa, are also part of CGPS but must meet on-site residency requirements. Global partnerships locations also offer primarily face-to-face classes.

Detroit Regional Office
999 Republic, Suite 200
Allen Park, MI 48101
260-665-4664
online@trine.edu

Tempe Regional Office
2900 S Diablo Way, Suite D281
Tempe, AZ 85282
260-665-4664
online@trine.edu

Reston Regional Office
1881 Campus Drive
Reston, VA 20191
260-665-4664
online@trine.edu

TrineOnline
260-665-4664
online@trine.edu

**The Brooks College of Health Professions**

The Brooks College of Health Professions is located in Fort Wayne, Indiana. The Parkview Hospital Randallia Campus site provides state-of-the-art laboratories and classroom technologies as well as partnerships with Lutheran and Parkview Health systems.

Brooks College of Health Professions

12817 Parkview Plaza Drive
Ft. Wayne, IN 46845
260-203-2914
trinefortwayneadmissions@trine.edu

# Admission

Trine University admits applicants on the basis of scholastic achievement and academic potential; selection is made without regard to race, religion, color, gender, sexual orientation, or age. Admission into Trine University is not an entitlement; attendance at Trine University is a privilege. Prospective students are encouraged to visit main campus. An admission counselor will make arrangements for a visitor to meet faculty, students, coaches, and financial aid personnel. Prospective students may visit classes and have a guided tour of campus facilities. Students who wish to arrange a campus visit should call or e-mail the Trine University Office of Admission at 260.665.4100, admit@trine.edu.

Trine University accepts an online application only. It can be accessed via the Internet at trine.edu. No application fee is required.

## Undergraduate

**Application Procedures and Requirements**

In addition to a completed application form, applicants must provide the following items:

- Evidence of graduation from school or an acceptable score on the General Education Development (GED) examination or High School Equivalency (HSE).
- Official high school transcripts must be sent from the originating high schools or official documentation from GED or HSE provided directly to the Office of Admissions or admission counselor of the education center they plan to attend.
- Transfer students must submit official transcripts from all post-secondary schools they attended. Official transcripts must be sent directly to the Office of Admission or the admission counselor of the education center they plan to attend.

Results from the American College Aptitude Test (ACT) or the Scholastic Aptitude Test (SAT) are optional and not required if the applicant has been out of high school for five years or more.

**Recommended High School Preparation**

All prospective students should have satisfactorily completed a minimum of the following high school courses: four years of English and three years each of science, social studies, and mathematics.

**Stem Focused Applicants**

All prospective STEM majors are advised to have completed two years of algebra, one year of geometry, and a semester of trigonometry. Prospective engineering majors in addition should have completed one year each of chemistry and physics.

**Math and English Placement**

Faculty advisors recommend beginning mathematics and English courses based upon a student’s SAT and/or ACT exam results and high school GPA.

**Surgical Technology and RN-BSN**

Please see the link for admission information on following programs: Surgical Technology and RN-BSN.

# Graduate

**Admission Requirements**

1. **Degree and GPA Requirements.** Except for the Dual Undergraduate/Graduate program applicants (See Student Classifications below), students seeking to enroll in graduate studies must have:

    a. A 3.0 GPA ***and***,

    b. A bachelor's degree from an approved institutionally-accredited university in an appropriate academic field, ***or***

    c. a bachelor's degree from an approved institutionally-accredited university in a related field and significant major-specific professional experience, ***or***

    d. A bachelor's degree from a non-approved institutionally-accredited university in an appropriate or related field and a combined GRE verbal/quantitative score of 300. (A GMAT score of 570 or higher may substitute for the GRE at the discretion of the Department Chair, Program Director, or Dean.) The scores must not be more than five years old from July 1 of the application year. An *official* copy must be sent to the Graduate School directly from Educational Testing Service. Note: GRE scores are considered alongside several other factors during the application review process. Admission will not be exclusively decided based on the student's GRE score.

2. **International Students.**

    a. Applicants whose native language is not English must provide evidence of one of the following: a 79 on the internet-based Test of English as a Foreign Language (TOEFL), an overall 6.5 on the International English Language Testing System (IELTS), a PTE score of 25 or a Duolingo score of 95.

    b. Applicants must also have earned at least a 3.0 GPA. If their undergraduate coursework was not completed at an American institution, their transcripts will need to meet internationally accepted standards or be reviewed by professional credential evaluators.

    c. Some graduate programs may have additional admission requirements.

    d. Please note that additional non-academic documents such as a passport are required. Complete information can be found on the international admission requirements page.

3. **Application Requirements.** Prospective graduate students are required to submit the following documents as part of their application package:

    a. Completed graduate application

    b. Official academic transcripts from each previous undergraduate and graduate institution attended (except Trine University). Transcripts from prospective students will be evaluated by the Program Chair/Director in consultation with the school Dean to determine if additional undergraduate coursework is required to adequately prepare for the rigors of graduate coursework.

    c. Personal narrative that explains the student's interest in pursuing a graduate level education.

    d. The applicant's resume or vita indicating positions held that demonstrate task commitment, knowledge and skill relevant to the applicable course of study.

***Note:*** *Additional program-specific admission requirements may exist. Some graduate programs may have additional admission requirements. Please refer to admission requirements for the specific program. Admittance to any graduate program is valid for one year from the time of admission to enrollment.*

- Please see the link for admission information for the following graduate programs:

- Doctor of Physical Therapy

- Master of Physician Assistant Studies

- Master of Education in Early Childhood Montessori Education

4. **Conditional Admission.** In order to be considered as a candidate for conditional graduate admission, students who have not earned a cumulative GPA of 3.0 in an undergraduate degree program must submit the following materials to the Program Chair/Director in addition to required application materials:

a. Applicants will be asked to describe the challenges or extenuating circumstances that led to the student earning less than 3.0 GPA in undergraduate work in their personal narrative. Students must include a description of specific strategies they will use to ensure academic progress within their graduate degree program.

b. Upon receipt of all the materials, the conditional application will be reviewed by the Department Chair/Program Director and a recommendation will be made to the appropriate Dean for conditional admission. A student admitted conditionally will become a graduate student in good standing upon completion of four graduate level courses maintaining a B or better grade in each course. Conditional graduate students not garnering a grade of B or better in each of their first four courses will be dismissed.

**Shared Progress**

The institution's policy and practice assure that at least 50% of courses applied to a graduate program are courses designed for graduate work, rather than undergraduate courses credited toward a graduate degree. Trine University allows well prepared advanced students to substitute its graduate courses for required or elective courses in an undergraduate degree program and then subsequently count those same courses, with a "B" or better earned, as filling graduate requirements in a related graduate program. For the DPT and the PA programs the first three years GPA will be for the undergraduate course, the final three years will be on the graduate degree.

**Payment of Educational Costs**

Payment of tuition and fees is due at the Business Office on the date indicated on the student's bill. Any student with outstanding financial obligations to the University will not be permitted to register for any subsequent semester or receive a transcript or diploma until the obligation is fulfilled. Students maintaining a balance owed to the University will be assessed late fees and will be responsible for collection and/or attorney costs if such efforts should become necessary.

# Dual Undergraduate/Graduate Student Classification

These programs offer the opportunity for undergraduate students to begin work towards a graduate degree.

- **College of Health Professions 3 + 3 Degree Paths**
  Trine University offers a direct admit six year plan of study to qualified students. Dual undergraduate/graduate enrollment status is granted to those student who have completed the first 3 years of the 3+3 Doctor of Physical Therapy degree program or the 3+2.5 Master of Physician Assistant degree program. These students will be graduate candidates in year four. Students who do not meet this standard will not be given graduate status. Students will be awarded each degree upon completion of its respective degree requirements. All institutional scholarships for undergraduate programs will not be available during years four, five, and six when they are considered a graduate student. Students are encouraged to investigate alternative funding opportunities to complete graduate school during these last years.

  **Doctorate of Physical Therapy (DPT) Direct Entry Admission**

  **Master of Physician Assistant (PA) Direct Entry Admission**

- **4+1 Integrated Undergraduate/Graduate**
  The 4+1 undergraduate/graduate enrollment status is granted to those who concurrently seek a bachelor's and master's degree from the Allen School of Engineering and Computing, Ketner School of Business, or Jannen School of Arts & Sciences. These students will be changed to graduate status after earning their required undergrad credit hours, at which time they must have a cumulative grade point average of at least 3.0. Students who do not meet this standard will not be given graduate status and will be awarded the bachelor's degree when the bachelor's degree requirements are met. Students will be awarded each degree (BS and MS) upon completion of its respective degree requirements.

  The following bachelor degrees are available to start on the 4 + 1 degree path: Accounting, Biomedical Engineering, Chemical Engineering, Civil Engineering, Criminal Justice, Communication, Electrical Engineering, Golf Management, Management, Marketing, Mechanical Engineering, or Sport Management.

  All institutional scholarships for undergraduate programs will not be available once the student is considered a graduate student. Students are encouraged to investigate alternative funding opportunities to complete graduate school.

- **Graduate**

**Special Graduate Student**

Special Graduate Student status maybe granted to those students who wish to (1) audit a course, (2) seek certification in specialized areas, or (3) enroll in certain courses but do not plan to pursue a graduate degree program.
For degree-seeking students who audit courses, a fee of ½ the normal rate is charged per credit hour. For special graduate students who are non-degree seeking, full tuition will be charged.

**Dual Concentration Master's Degree Students**

Students are permitted, but not required, to enroll in multiple concentrations while completing their master's program. If the student seeks to complete a second concentration as a continuation of his or her master's program, and does not choose to receive his or her degree prior to continuing with the second concentration, the student still must receive a 3.0 GPA or higher to graduate from the program. If the student's GPA falls below a 3.0 while the student is completing the second concentration, the student will not receive his or her degree, even if the student had the requisite GPA at the end of completing the first concentration.

Students are also advised to check with the financial aid department prior to pursuing a second concentration to ensure the student understands any impact a second concentration may have on financial aid.

# Transfer Student Admission

A transfer student follows Trine University's general application admission procedures, however results from the American College Aptitude Test (ACT) or the Scholastic Aptitude Test (SAT) are not required. Students are eligible for admission from regionally accredited institutions of higher learning, and those approved by the University. Trine University encourages applications from community college graduates. Trine University offers transfer scholarships to qualified full-time, main campus applicants. Trine University offers a number of "two-plus-two" degree program options. Graduates of two-year programs in applied science should anticipate a minimum of six semesters to complete a bachelor's degree in engineering.

Transfer students applying to the Allen School of Engineering and Computing must have a minimum cumulative grade point average of 2.5 and a grade of "C" or better in Calculus I, Chemistry I, and College Composition.

Transfer students applying to the Franks School of Education must have a minimum cumulative grade point average of 3.0 and a grade of "C" or better in a mathematics course, a social sciences or humanities course, and English Composition 1.

Transfer students applying to the Rinker Ross School of Health Sciences must have a minimum cumulative grade point average of 2.5 and a grade of "C" or better in a mathematics course, a social sciences or humanities course, and English Composition 1.

Transfer students applying to the Ketner School of Business and the Jannen School of Arts and Sciences must have a minimum cumulative grade point average of 2.25 and a grade of "C" or better in a mathematics course, a social sciences or humanities course, and English Composition 1.

Transfer students applying to the College of Graduate and Professional Studies/TrineOnline must have a minimum cumulative grade point average of 2.5. Students cannot be on academic probation from the previous institution(s).

For more information contact your admissions representative.

# International Student Admission

International students who wish to study full-time on the main campus may apply for admission as freshmen or as transfer students. The application deadline for fall admission is June 1 and for spring admission November 1. By following these deadlines, the prospective student will have ample time for long distance correspondence, obtaining a US visa, and making travel arrangements. An international applicant to Trine University is required to submit the following materials:

**Application Form**

A completed Trine University International online application must be submitted to the Office of Admission. Prospective students may apply online at trine.edu. (No application fee required.)

**Financial Guarantee**

US Department of Homeland Security regulations require that students demonstrate their ability to finance the first year of education before receiving the I-20 AB form. A financial guarantee (bank statement) must be submitted before the I-20 AB form is issued.

**Academic Records**

The student must send complete, official academic records, in English, to: Trine University Office of Admission, and should include courses taken, grades received and degrees or certificates earned. An explanation of the coding system used to evaluate the student's work should accompany the records. Transfer students should have official transcripts sent from each institution of higher education attended, in English, as described above. Course descriptions and/or syllabi from those institutions must also be included. If the transfer student is presently residing in the United States, a photocopy of the current I-20 must be enclosed.

**Test Scores**

Applicants whose native language is not English must provide evidence of one of the following: a 79 on the internet-based Test of English as a Foreign Language (TOEFL), an overall 6.5 on the International English Language Testing System (IELTS), a PTE score of 58 or a Duolingo score of 95.

Awarding of transfer credit is contingent upon demonstration of knowledge on placement examinations to be given upon arrival on campus.

# Readmission

**Readmit**

Students who have attended Trine University but withdrew for more than one semester (not including summer) must go through the readmission process. *Available for associate, bachelor's or master's programs.*

- Submit a Readmission application.
- Submit official transcripts from any institutions attended after Trine University's last date attended.
- The readmit committee will determine the outcome of the readmit request.

**Dismissed Student Readmit**

If you were dismissed for academic or other disciplinary reasons, you must submit a Dismissed Student Readmission

application along with a statement of explanation 3-4 paragraphs in length explaining why you were/are not meeting academic standards. It should also outline a plan for future success. The readmit committee will determine the outcome of the readmit request.

**Re-Entry**

Students who have attended Trine University but withdrew for only one semester (not including summer) should contact their respective campus for re-entry.

# Dual Enrollment Program for High School Students

Trine University provides an opportunity for high school students to earn dual credit (college and high school credit simultaneously). Courses are offered in the following ways: on Trine University campuses and online (blended with Trine University students), and on the campuses of participating high schools (strictly for high school students through the concurrent enrollment program).

To qualify for Dual Enrollment, students must meet the following requirements: submit an official Dual Enrollment application and a current high school transcript, be in good academic standing in high school (GPA of B or higher or by recommendation of the high school guidance counselor) and be currently enrolled in a public, private, or home school.

Courses on campus and online are offered throughout the calendar year, and students may register for any courses in which they meet the prerequisites. Courses on high school campuses are offered during the school year, and high schools only offer specific courses. Tuition is set at a significantly reduced rate. Students taking courses on the campuses of Trine University or online must provide the books specified by the course syllabus; students enrolled in the concurrent enrollment program generally rent books through their regular high school book rental program (this is decided by the participating high school).

A high school student in the non-degree Dual Enrollment Program may earn up to 90 credit hours. If the student completes all academic course requirements to earn an associate degree, the student will be awarded an associate degree on the condition the student attends Trine University directly after high school graduation and successfully completes one regular fall or spring semester as a full-time degree-seeking student.

All Dual Enrollment students must sign enrollment forms that cover the policies and procedures related to Dual Enrollment participation. Dual Enrollment students are registered students with the university and must abide by policies stated in the Trine University Student Handbook.

Trine University Dual Enrollment is a member of the National Alliance of Concurrent Enrollment Partnerships (NACEP).

More information is available at trine.edu or by calling the Dual Enrollment office at 260.665.4311

# Non-Degree Students

A person may apply as a non-degree student without showing evidence of a high school diploma or an acceptable score on the GED test. Non-degree students who later apply for degree status must meet the degree requirements of the program to which they seek admittance.

An applicant may be admitted to Trine University as a non-degree student in certain programs. The non-degree student is limited to a maximum of 30 semester credit hours attempted. To continue taking courses after 30 credit hours are earned, the non-degree student must apply for and be accepted to degree status. Students wishing to change from non-degree status to a degree program should apply for admission through the Office of Admission.

For information regarding Dual Enrollment as a high school student please reference Dual Enrollment Program for High School Students.

# Non-Degree Senior Citizens

Trine University offers free tuition for persons 60 years of age or older who reside in Steuben County to audit undergraduate courses for non-credit. Non-degree audited courses will not earn credit nor a grade and cannot be applied toward a degree program at Trine University.  Enrollment is granted on a space-availability basis.

# Transfer Credit

Credits earned at an approved institution where the work completed is of similar rigor and content to the course offerings available at Trine University, with grades of "C" or better, may be transferred to Trine University. An evaluation of transfer credit shall be made when the University receives an official transcript of the completed coursework. To facilitate the evaluation, the applicant should provide the Office of Admission with a catalog or guide which contains descriptions of the courses completed elsewhere.

**Evaluation Process -** Please note, not all accepted credits may count towards the specific degree requirements of the chosen major.

- **Main Campus** - In determining transfer credit for the main campus, the Director of Transfer Pathways and Evaluations evaluates all transfer credit. The Director then sends the accepted credit to the Department Chair who approves and returns it to the Director who forwards to the Registrar. The Registrar approves the credit and adds it to the records.
- **TOL** - In determining transfer credits for TOL, the Director of Transfer Pathways and Evaluations evaluates all transfer credit and sends it to the Dean of TOL for approval, the Dean then returns to the Director who forwards to the Registrar. The Registrar approves the credit and adds it to the records.
- **Graduate** - In determining transfer credits for graduate programs, a graduate student must have successfully completed one (1) semester of course work at Trine before they can apply for a transfer credit evaluation with the Director of Graduate Programs. Once the Director has received their request he/she will evaluate the requested course(s) for transfer. The Director forwards the evaluation to the Registrar. The Registrar approves the credit and adds it to the records. The programs within the Brooks College of Health Professions, Master of Education, and Doctor of Information Technology do not accept transfer credit.

**Academic Residency/Transfer Credit**

- **Undergraduate** - Undergraduate students are eligible to transfer in up to 45 semester credits for an associate's degree or up to 90 semester credits towards a bachelor's degree which can include prior college coursework, experiential learning, college level examinations, or military coursework. Only course credits will transfer, not the grade, and, therefore, will not impact the student's GPA. Thirty (30) of the last sixty (60) credits must be earned through Trine University. A student must be enrolled in at least one (1) Trine course that last semester prior to graduation.
- **Graduate** - A maximum of 6 semester hours of graduate course credit **may** be counted toward completion of a graduate degree at Trine University with a grade of B or above and with the approval of the program Chair/Director and Dean. All other courses must be taken at Trine University. Transfer credit will not include a grade and, therefore, will not impact the student's GPA. Courses used to satisfy the requirements of a bachelor's degree cannot be applied to a master's degree. The final 15 credit hours must be received within Trine University. This transfer credit policy does not apply to the the Brooks College of Health Professions, Master of Education, nor the Doctor of Information Technology.

**Credits by Examination - Standardized Testing**
Students may earn credit through selected nationally recognized tests up to 30 credits including: College Level Examination Program (CLEP), Defense Activity of Non-Traditional Education Support (DANTES), certain other tests approved by American Council on Education and Trine University examinations by department.

**Credits from Prior Credit Bearing Coursework**
Credits earned from an approved college/university and completed with a grade of "C" or better may be transferred.

**Credits from Military Coursework**
Credit is awarded for coursework offered by the military as recommended by the American Council on Education in its Guide to the Evaluation of Educational Experiences in the Armed Services.

**University Credit by Exam**
A student may earn credit by taking an examination for approved courses administered by the appropriate academic department. Students should contact the academic department to determine the availability of tests. A fee is associated. University Credit by Exam application forms are available in the Office of the Registrar.

There is no credit by examination in the Trine graduate programs.

# Awarding of Credit by Examination (AP, CLEP, IB, PLTW)

## Advanced Placement (AP) Examination

An applicant who achieves a score of 3, 4, or 5 on the College Entrance Examination Board's Advanced Placement (AP) Examination may be granted credit. Results of the examination should be sent to the Office of the Registrar.

| AP COURSE/EXAM | SCORE | TRINE EQUIVALENT COURSE | CREDIT HOURS |
|---|---|---|---|
| **Arts** | | | |
| Art History | 3, 4, 5 | Humanities Elective | 3 |
| Music Theory | 3, 4, 5 | MUS 103 | 3 |
| Studio Art 2-D Design | 3, 4, 5 | Humanities Elective | 3 |
| Studio Art 3-D Design | 3, 4, 5 | Humanities Elective | 3 |
| Studio Art Drawing | 3, 4, 5 | Humanities Elective | 3 |
| **English** | | | |
| English Language & Composition | 3, 4, 5 | ENG 143 | 3 |
| English Literature & Composition | 3, 4, 5 | ENG 153 | 3 |
| **History & Social Sciences** | | | |
| Comparative Govern. & Politics | 3, 4, 5 | POLS 113 | 3 |
| European History | 3, 4, 5 | HIS 203 and HIS 213 | 6 |
| Human Geography | 3, 4, 5 | GEO 303 | 3 |
| Macroeconomics | 3, 4, 5 | ECO 223 | 3 |
| Microeconomics | 3, 4, 5 | ECO 213 | 3 |
| Psychology | 3, 4, 5 | PSY 113 | 3 |
| U.S. Government & Politics | 3, 4, 5 | POLS 113 | 3 |
| United States History | 3, 4, 5 | HIS 103 and HIS 113 | 6 |
| World History | 3, 4, 5 | HIS 203 and HIS 213 | 6 |
| World History: Ancient | 3, 4, 5 | HIS 203 | 3 |
| World History: Modern | 3, 4, 5 | HIS 213 | 3 |
| **Math & Computer Science** | | | |
| Calculus AB | 3 | MA 173 | 3 |
| Calculus AB | 4, 5 | MA 134 | 4 |

| | | | |
|---|---|---|---|
| Calculus BC | 4, 5 | MA 134 and MA 164 | 8 |
| Calculus BC subscore | 4, 5 | MA 134 | 4 |
| Computer Science Principles | 3, 4, 5 | CSIT 103 | 3 |
| Computer Science A | 3, 4, 5 | CS 1113 or INF 143 | 3 |
| Precalculus | 3, 4, 5 | MA 124 | 4 |
| Statistics | 3, 4, 5 | MA 253 | 3 |
| **Sciences** | | | |
| Biology | 3, 4, 5 | BIO 114 | 4 |
| Chemistry | 3, 4 | CH 104 | 4 |
| Chemistry | 5 | CH 104 and CH 114 | 8 |
| Environmental Science | 3, 4, 5 | BIO 334 | 4 |
| Physics 1 | 3, 4, 5 | PH 154 | 4 |
| Physics 2 | 3, 4, 5 | PH 164 | 4 |
| Physics C: Mechanics | 3, 4, 5 | PH 224 | 4 |
| Physics C: Electricity & Magnetism | 3, 4, 5 | PH 234 | 4 |
| **World Language & Culture** | | | |
| Chinese Language & Culture | 3, 4, 5 | Humanities Elective | 6 |
| French Language & Culture | 3, 4, 5 | FRN 113 and FRN 123 | 6 |
| German Language & Culture | 3, 4, 5 | GER 104 and GER 114 | 8 |
| Italian Language & Culture | 3, 4, 5 | Humanities Elective | 6 |
| Latin | 3, 4, 5 | Humanities Elective | 3 |
| Spanish Language & Culture | 3, 4, 5 | SPN 113 and SPN 123 | 6 |
| Spanish Literature & Culture | 3, 4, 5 | SPN 113 and Humanities Elective | 6 |

*Transfer credit subject to Department approval*

# CLEP Examination

Trine University awards credit based upon the College Level Examination Program's (CLEP) general and subject-matter examinations. Trine University is not a testing site for either examination program.

Trine University accepts the American Council on Education's recommended passing score in effect at the time of the administration of the examination. Upon achieving a score considered passing by Trine University, CLEP credit will be listed on the student's transcript for the number of semester hours recommended in the official CLEP publications.

| CLEP EXAM | SCORE | TRINE EQUIVALENT COURSE | CREDIT HOURS |
|---|---|---|---|
| **Business** | | | |
| Financial Accounting | 50 | AC 203 | 3 |
| Information Systems | 50 | BA 113 | 3 |
| Intro Business Law | 50 | LAW 203 | 3 |
| Principles of Management | 50 | Electives | 3 |
| Principles of Marketing | 50 | MK 203 | 3 |
| **Composition & Literature** | | | |
| American Literature | 50 | ENG 2113 | 3 |
| Analyzing & Interpreting Literature | 50 | ENG 153 | 3 |
| College Composition | 50 | ENG 143 | 3 |
| College Composition Modular | 50 | ENG 143 | 3 |
| English Literature | 50 | ENG 2013 | 3 |
| Humanities | 50 | Humanities Elective | 3 |
| **World Languages** | | | |
| French Language, Level 1 | 50 | FRN 113 | 3 |
| French Language, Level 2 | 59 | FRN 113 and FRN 123 | 6 |
| German Language, Level 1 | 50 | GER 104 | 4 |
| German Language, Level 2 | 60 | GER 104 and GER 114 | 8 |
| Spanish Language, Level 1 | 50 | SPN 113 | 3 |
| Spanish Language, Level 2 | 63 | SPN 113 and SPN 123 | 6 |
| **History & Social Science** | | | |
| American Government | 50 | POLS 113 | 3 |
| History of the United States I | 50 | HIS 103 | 3 |
| History of the United States II | 50 | HIS 113 | 3 |
| Human Growth & Development | 50 | Psychology Elective | 3 |
| Intro to Educational Psychology | 50 | Psychology Elective | 3 |
| Introductory Psychology | 50 | PSY 113 | 3 |
| Introductory Sociology | 50 | SOC 103 | 3 |

| | | | |
|---|---|---|---|
| Principles of Macroeconomics | 50 | ECO 223 | 3 |
| Principles of Microeconomics | 50 | ECO 213 | 3 |
| Social Sciences & History | 50 | Social Science Elective | 6 |
| Western Civilization I | 50 | HIS 203 | 3 |
| Western Civilization II | 50 | HIS 213 | 3 |
| **Science & Mathematics** | | | |
| Biology | 50 | BIO 114 | 4 |
| Calculus | 50 | MA 134 | 4 |
| Chemistry | 50 | CH 104 | 4 |
| College Algebra | 50 | MA 113 | 3 |
| College Mathematics | 50 | Math Elective | 3 |
| Natural Sciences | 50 | Science Elective | 3 |
| Precalculus | 50 | MA 124 | 4 |

*Transfer credit subject to Department approval*

## International Baccalaureate

Transfer credit may be awarded for International Baccalaureate Higher Level courses with a score of 5 or higher. Results of the examination should be sent to the Office of the Registrar.

| IB HIGHER LEVEL COURSE | SCORE | TRINE EQUIVALENT COURSE | CREDIT HOURS |
|---|---|---|---|
| **Arts** | | | |
| Dance HL | 5, 6, 7 | Elective | 3 |
| Film HL | 5, 6, 7 | FLM 203 | 3 |
| Music HL | 5, 6, 7 | Humanities Elective | 3 |
| Theatre HL | 5, 6, 7 | THE 103 | 3 |
| Visual Art HL | 5, 6, 7 | ART 253 | 3 |
| **Language Acquisition** | | | |
| Classical Language HL | 5, 6, 7 | Humanities Elective | 6 |
| Foreign Language A HL | 5, 6, 7 | Humanities Elective | 3 |
| Foreign Language B HL | 5, 6, 7 | Humanities Elective | 6 |
| **Language and Literature** | | | |
| English A HL | 5, 6, 7 | ENG 143 | 3 |
| English B HL | 5, 6, 7 | ENG 143 and ENG 153 | 6 |
| Language A: Literature HL | 5, 6, 7 | ENG 143 | 3 |

| | | | |
|---|---|---|---|
| Language A: Language and Literature HL | 5, 6, 7 | ENG 143 and ENG 153 | 6 |
| **Individuals and Societies** | | | |
| Business Management HL | 5, 6, 7 | BA 123 | 3 |
| Economics HL | 5, 6, 7 | ECO 203 or ECO 213 | 3 |
| Geography HL | 5, 6, 7 | GEO 213 or EAS 213 | 3 |
| Global Politics HL | 5, 6, 7 | Social Science Elective | 3 |
| History HL | 5, 6, 7 | Social Science Elective | 6 |
| History Africa and Middle East | 5, 6, 7 | HIS 203 and HIS 213 | 6 |
| History Americas HL | 5, 6, 7 | HIS 103 and HIS 113 | 6 |
| History Asia and Oceania | 5, 6, 7 | HIS 203 and HIS 213 | 6 |
| History Europe | 5, 6, 7 | HIS 203 and HIS 213 | 6 |
| Information Technology in a Global Society HL | 5, 6, 7 | Elective | 3 |
| Philosophy | 5, 6, 7 | PHL 203 | 3 |
| Psychology | 5, 6, 7 | PSY 113 | 3 |
| Social and Cultural Anthropology HL | 5, 6, 7 | Social Science Elective | 3 |
| **Mathematics** | | | |
| Mathematics: Analysis & Approaches HL | 5, 6, 7 | MA 113 | 3 |
| Mathematics: Applications & Interpretations HL | 5, 6, 7 | MA 113 | 3 |
| Mathematics (Further) HL | 5, 6, 7 | MA 134 | 4 |
| **Sciences** | | | |
| Biology HL | 5, 6, 7 | BIO 114 | 4 |
| Chemistry HL | 5, 6, 7 | CH 104 | 4 |
| Computer Science HL | 5, 6, 7 | Electives | 3 |
| Design Technology HL | 5, 6, 7 | Electives | 3 |
| Physics HL | 5, 6, 7 | PH 104 | 4 |
| Sports, Exercise & Health Science HL | 5, 6, 7 | Elective | 3 |

*Transfer credit subject to Department approval*

# Project Lead the Way Tuition Scholarships – Angola Campus

- Value: $500 annually ($250 per semester) and may be renewed for up to three years for a total value of $2,000 over four years. This scholarship may be stacked on top of other Trine University merit-based awards, but not to exceed tuition
- Renewal Criteria: must continue to pursue a Trine University engineering or technology degree and make satisfactory progress towards completing the degree.
- Eligibility: must have completed a minimum of two PLTW high school courses with grade of "B" or better in each course and provide a transcript documenting these courses from a PLTW certified high school.

| **Program** | **Maximum Credit[1]** | **Remarks[2]** |
|---|---|---|
| **Trine University Engineering and Computing Majors** | | |
| Biomedical Engineering | 3 | Take any 2 PLTW Engineering courses for 3 credits of electives |
| Chemical Engineering | 7 | 2 credits of electives for each PLTW Engineering course |
| Civil Engineering | 3 | Complete IED, POE and either CEA, ES or EDD for 3 credits of Professional Development Elective |
| Computer Engineering | 3 | Complete IED, POE, EDD and DE (or CIM) for 3 credits of electives |
| Computer Science & Information Technology | 18 | CSE will transfer in as CSIT 103<br>CSA will transfer in as CS 1113<br>CSP will transfer in as CSIT 163<br>CYB will transfer in as INF 343<br>2 credits for each PTLW Engineering course for a maximum of 6 credits of unrestricted electives |
| Cybersecurity | 18 | |
| Design Engineering Technology | 15 | IED will transfer in as ETD 103<br>POE will transfer in as ETD 203<br>DE will transfer in as ETD 273<br>Up to 6 additional credits may be granted as electives |
| Electrical Engineering | 3 | Complete IED, POE, EDD and DE (or CIM) for 3 credits of electives |
| Extended Reality | 18 | CSE will transfer in as CSIT 103<br>CSA will transfer in as CS 1113<br>CSP will transfer in as CSIT 163<br>CYB will transfer in as INF 343<br>2 credits for each PTLW Engineering course for a maximum of 6 credits of unrestricted electives |
| Mechanical Engineering | 6 | Complete IED, POE and/or AE for 6 credits of electives |
| Mechatronics & Robotics Engineering | 6 | Complete IED, POE and/or AE for 6 credits of electives |
| Software Engineering | 3 | Complete IED, POE, EDD and DE (or CIM) for 3 credits of electives |
| **Trine University Health Science Majors** | | |
| Applied Health Science | 8 | 2 credits for each PLTW Biomedical Science course for a maximum of 8 credits of electives |
| Biology | 8 | |

| | | |
|---|---|---|
| Chemistry | 8 | |
| Biochemistry | 8 | |
| Forensic Science | 8 | |
| Exercise Science | 8 | |
| ***Transfer credit subject to Department approval*** | | |

**Notes**
[1] These are the maximum possible unrestricted electives in each major.
[2] Students must earn a "B" or better to earn credit.

| **PTLW Engineering Courses** | **PLTW Computer Science Courses** | **PLTW Biomedical Science Courses** |
|---|---|---|
| AE = Aerospace Engineering<br>CEA = Civil Engineering & Architecture<br>CIM = Computer Integrated Manufacturing<br>DE = Digital Electronics<br>EDD = Engineering Design & Development<br>ES = Environmental Sustainability<br>IED = Intro to Engineering Design<br>POE = Principles of Engineering | CSA = Computer Science A<br>CSE = Computer Science Essentials<br>CSP = Computer Science Principles<br>CYB = Cybersecurity | BI = Biomedical Innovation<br>HBS = Human Body Systems<br>MI = Medical Interventions<br>PBS = Principles of Biomedical Science |

## University Credit by Exam

A student may earn credit by taking an examination for approved courses administered by the appropriate academic department. Students should contact the academic department to determine the availability of tests. A fee is assessed. And application forms are available in the Office of the Registrar.

# Experiential Learning Policy (ELP)

Trine University recognizes that knowledge gained outside of a classroom may be relevant to your academic degree program. Learning experiences gained through employment, non-collegiate, school-based education or other appropriate channels may be evaluated for course or elective credit.

To be **considered** for experiential learning, your prior experience must relate specifically to a course at Trine University through course competency evidence with mapping of course learning outcomes or free electives in your program.

An experiential learning portfolio is required as evidence that verifies mastery of course learning outcomes through documentation. If your experiential learning portfolio demonstrates that your prior experience(s) meets all course learning outcomes, your experiential learning will allow you to earn full credit for the course or elective.

Please note, some programs with special accreditation will limit or exclude credit for experiential learning.

**What is required in the experiential learning portfolio?**

1. Experiential Learning Student Form (found in myPortal)
2. Resume: A professional resume documenting the student's professional career
3. Autobiography

4. Course competency evidence with mapping of course learning outcomes
5. Documentation that supports and provides evidence of course learning outcome mastery, examples of documents are listed below.

Documents that can aid in awarding experiential learning credits:

1. HR documentation: Human Resource performance information such as job descriptions and performance evaluations, if available. A job description provided by Human Resources does NOT substitute for the required information. Performance evaluations will be copies of the originals kept by the employer and must show signatures to be considered as proof of performance.
2. Letters from current and past employers verifying job responsibilities.
3. Copies of articles, special awards and letters of recommendation.
4. Samples of writing and/or computer skills including letters, brochures and programs.
5. Photocopies of licenses and certificates of completion for non-credit work.

**Experiential Learning Portfolio Evaluation**

Experiential Learning Portfolios are reviewed by the Registrar and the school Dean. Review of the portfolio can take up to 30 days before a decision is provided to the student.

Students may only transfer up to 15 semester credits for an associate's degree, up to 30 semester credits towards a bachelor's degree, and 0 credits towards master's degree from an experiential learning portfolio. Most general education coursework cannot be awarded transfer credit from an experiential learning portfolio.

# Tuition and Fees

## Payment of Education Costs

For updated payment of costs please go to trine.edu/costs.

Payment of tuition, fees, and room and board is due at the Business Office on the date indicated on the student's bill. Any financial aid awarded will be deducted from the student's charges each semester. Each student is responsible for purchasing books using funds from personal and/or financial aid sources. Any student with outstanding financial obligations to the University will not be permitted to register for any subsequent semester, or receive a transcript or diploma until the obligation is fulfilled. Students maintaining a balance owed to the University will be assessed late fees and will be responsible for collection and/or attorney costs if such efforts should become necessary.

*Please see specific program for additional fees.

**Flat Rate Tuition**

A flat rate tuition charge is assessed to each main campus student registered for the full-time load of 12–18 credit hours per semester. Individual credit hour charges are applied to overloads and loads less than full-time.

**Auditing Fee**

A fee is charged per credit hour for auditing courses. To learn the amount of this fee, call the Business Office.

**Course Fees**

Additional fees may be incurred for online courses and other specialized courses.

**Engineering and Science Fee**

A fee is charged for all engineering and science majors.

**Enrollment Deposit**

All admitted domestic applicants must confirm their intention to enroll by paying a $300 Enrollment Deposit. A portion of the fee ($150) will be used as a housing deposit. Enrollment deposits are fully refundable before May 1. Request for an extension must be made in writing.

**Discounted Tuition**

Discounted tuition may be available to students who have graduated from specific colleges that have prearranged agreements with Trine University. Certain criteria apply to receiving and continuing to receive the discount to these eligible students.

An eligible student must meet the qualifying criteria:

- Graduated from an approved college with an associate's degree and cumulative grade point average of 3.0 or better.
- Maintain a 3.0 while at Trine University
- Complete 30 hours at Trine University and fulfill all program requirements
- May be a full or part-time student
- Please note: To qualify for graduation honors a student must complete 40 hours at Trine University.

The discount may be used for a second bachelor's degree if all other requirements are met. The discount may not be applied to

Trine University's graduate programs.

**International Fee**

All entering international students are assessed a one-time non-refundable fee upon enrollment for an orientation program and specialized programs and services. A portion of the fee will be used as a housing deposit. For additional fees related to international students please see International Admissions.

**Student Fee**

A fee is charged for all full-time students.

**Monthly Payment Plan**

A monthly payment plan service is available through a national organization specializing in education financing. Parents desiring information concerning the monthly payment plan may request a pamphlet from the business office, or at trine.edu.

# Other Costs

**Books and Supplies**

Book and supply expenses vary depending on the number of courses taken and the major and are the personal obligation of each student.

Book and supply expenses vary depending on the number of courses taken and the major, and are the personal obligation of each student. Students can order books from the Trine University bookstore through the online order process by clicking on "Bookstore" at the bottom of the Web page at trine.edu. Students may also visit the bookstore in person or call the bookstore at 260.665.4153.

**College of Graduate and Professional Studies Laptop Computer/Tablet Requirement**

All students enrolled in CGPS are required to have or purchase a laptop computer or tablet that meets the CGPS minimum specifications before attending their first class.

All students are required to sign a "Laptop/Tablet Policy - Statement of Understanding" and a copy is maintained in the student's file. The statement of understanding informs students of the requirement to have or purchase a laptop computer or a tablet and convey for use to all classes.

To assist students, all locations have available wireless internet access.

**Miscellaneous Fees**

A student is responsible for any additional fees such as fines, parking tickets, and equipment breakage.

**Main Campus Room and Board**

A 19-meal per week plan or a 10-meal per week plan is required for all students residing in the units or apartments. Villa students and commuter students have the option of a 50-meal per semester plan; however they may also opt into the other plans. When the University is in session, three meals are available daily Monday through Friday. Brunch and evening meals are available Saturdays and Sundays.

**Personal Expenses**

Expenditures for personal items such as travel, membership fees and similar expenses should be included when prospective students are estimating total costs of their university experience.

**Personal Insurance**

Trine University is not responsible for the damage and/or loss of a student's personal property of any type. This includes, but is not limited to, personal electronic devices, printers, stereo equipment, microwaves, refrigerators, etc. All damage or loss incurred to a student's personal property is solely the responsibility of the student. The causes of this damage can be, but are not limited to, theft, power outages, power surges, etc. It is recommended that all students verify that their personal property is covered by personal insurance. If this is not the case, it is recommended that students acquire renter's insurance, which can be obtained through parents' homeowners insurance company and/or agent.

# Refunds

## Main Campus

Refunds of tuition and room and board follow the schedule below. The international fee and enrollment fee are not refundable.

Tuition Fall and Spring Semester

- Week One—100%
- Weeks Two & Three—50%
- Week Four—0%

Tuition Summer Semester

- Week One—100%
- Week Two—0%

Room and Board

- Week One—Prorated at $50/day
- Weeks Two & Three—50%
- Week Four—0%

In the rare case an "exception" to the refund policy is granted, a $50 administration fee may be assessed.

Please note: If a student receiving financial aid withdraws during the semester, that aid is subject to the federal refund calculation.

Any student who is dismissed or suspended for misconduct shall not be entitled to any refund. No refund is provided at any time on fees, books and supplies, or personal expenses.

## College of Graduate and Professional Studies

Refunds of credit balances due to excess financial aid or overpayment will be refunded after the drop/add period. A student withdrawing from a course may be eligible for a full or partial refund of tuition, depending on when the official withdrawal takes place.

A student is not officially withdrawn until the necessary withdrawal forms, complete with the required signatures, is filed with the Office of the Registrar. Nothing other than an official withdrawal permits refunds. Refunds follow the schedule below.

Tuition Adjustment

- Week One—100%
- Week Two—0%

In the rare case an “exception” to the refund policy is granted, a $50 administration fee may be assessed.

Please note: If a student receiving financial aid withdraws during the semester, that aid is subject to the federal refund calculation.

Refunds are processed through the Business Office approximately one month after a student officially withdraws and all charges/credits are posted.

Any student who is dismissed or suspended for misconduct shall not be entitled to any refund. No refund is provided at any time on fees, books and supplies, or personal expenses.

For students at the Arizona location - Three-Day Cancellation: An applicant who provides written notice of cancellation within three days (excluding Saturday, Sunday and federal and state holidays) of signing an enrollment agreement is entitled to a refund of all monies paid. No later than 30 days of receiving the notice of cancellation, the school shall provide the 100% refund.

## Withdrawal

If a student decides to drop or withdraw after registering for classes:

- The student is responsible for completing the proper paperwork and filing it with the Office of the Registrar or the Educational Center Director. By failing to do so, the student accepts financial responsibility for all charges incurred on their account.
- The student may be eligible for a full or partial refund of tuition and room and board, depending on when the official withdrawal takes place.
- It may result in a change in the total amount due for the semester.
- It may result in a loss of financial aid from a federal, state or institutional source.
- Failure to attend classes does not constitute a drop/withdrawal.

## Teach Out Plan (Closing an Education Center)

In the case of closing an education center, Trine University is committed to providing students with a Teach Out Plan that is congruent with the expectations of the Higher Learning Commission.

# Financial Aid

**Purpose**

The mission of the Trine University Financial Aid Office is service-oriented and geared to proving access, choice, and education for interested students. To accomplish its mission, Trine University offers a variety of financial counseling and planning programs for student with economic need.

The Office of Financial Aid provides assistance to students and their families to make a college career at Trine University affordable. It is important to reward students for exceptional academic accomplishments. To provide such assistance allows students to attend who might not otherwise have the opportunity.

Most scholarships are merit-based. They are based on academic achievement. However, other grants and loans are awarded based upon financial need as determined by the federal and state governments after completion of the Free Application for Federal Student Aid (FAFSA).

The Office of Financial Aid provides a convenient location and several options of access for students and/or their families. The office offers walk-in counseling, telephone counseling, and can be contacted via email.

The Office of Financial Aid is located in Forman Hall, and has a street address of Office of Financial Aid, One University Avenue, Angola, Indiana, 46703.

Normal hours of operation are Monday through Friday, 8 a.m. to 5 p.m. The Office of Financial Aid can be reached by phone at 1.800.347.4878, option 2, by email at finaid@trine.edu, and accepts faxed documents at 260.665.4511.

Provided here is an overview of Financial Aid policies. For detailed information please see the Student Handbook, MyTrineFA site and/or the financial aid section of the Trine website for additional information or contact the Financial Aid Office toll free at 800.347.4878, option 2.

**Application Procedures**

All students applying for financial aid must complete the Trine University Online Application for Admission to be accepted into a degree-seeking program and complete a Free Application for Federal Student Aid (FAFSA) at www.fafsa.gov with school code 001839.

The FAFSA for new applicants or returning applicants is the primary application for assistance. This can be filed on line at www.fafsa.gov. It is used to determine eligibility for all Federal Title IV aid programs, such as Federal Pell Grant, Supplemental Educational Opportunity Grant, Federal Work Study Program, and Federal Direct Education Loan Programs. It is also the application for undergraduate Indiana residents to apply for tuition assistance programs from the State of Indiana.

The Trine University priority application filing deadline is March 1 of each academic year for fall/spring/summer enrollment; however, aid is awarded throughout the school year. Current students need only complete the FAFSA once each academic year before March 1 to reapply for all aid. The Trine University FAFSA filing priority deadline is March 1 to be eligible for all types of institutional aid.

The U.S. Department of Education’s Central Processing System (CPS) reviews and analyzes the information provided on the FAFSA. The CPS uses this information to calculate an Expected Family Contribution (EFC). The EFC is the index of the family’s financial strength and not necessarily the amount a family will have to pay towards college. Once Trine University receives this information, it will be used to create an electronic award notification.

## Satisfactory Academic Progress General Information

Trine is required to establish satisfactory academic progress standards (SAP) for its federal, institutional and state financial aid recipients in accordance with the US Department of Education regulations. These standards will ensure that only those

recipients who demonstrate satisfactory progress towards the completion of their educational programs (degrees) can continue to receive financial aid from all sources.

There are three areas that are evaluated after the end of each academic term; number of credit hours passed, cumulative grade point average (GPA) and maximum time frame for degree completion. For more information regarding the SAP policy access the FA Policies page on the Trine University website. A student must carry at least a 2.0 cumulative GPA to be eligible for financial aid.

# Loan Eligibility

A student may qualify for a federal direct loan. Eligibility is determined by the results of the FAFSA and the total number of hours enrolled each term. Maximum eligibility is determined based on a student's class year. Once a student accepts the loan there are three documents required in order to secure the funds to be disbursed: Master Promissory Note, Entrance Counseling and Financial Aid Awareness Counseling. A student must be enrolled in at least six credit hours to qualify for Federal Student Loans.

# Awarding Process

Each year Trine University awards over $20 million of institutional funds in the form of scholarships and grants.

Awards are processed by the Office of Financial Aid in accordance with University policy and the regulations governing the various aid programs. The University policy is established at an institutional level, and the Office of Financial Aid is responsible for determining financial aid eligibility based on the results the Department of Education submits to Trine University after a FAFSA is processed. An award notification detailing the type and amount of each award is posted on line at MyTrineFA. Students are notified once the FAFSA is received.

Assistance awarded by Trine University may only be used for the costs of tuition, fees and room and board in University owned facilities during the academic year that it is issued.

Additional descriptions of aid programs and satisfactory academic progress standards are included in the Trine University Student Handbook and on the University website.

**Main Campus Undergraduate Scholarships**

Trine University offers an extensive list of awards for prospective students. If you need additional information about awards offered, please contact your Admission Counselor or call the Office of Admission at 260.665.4100.

*Please note, students enrolled in 3+3, 3+2, or some 3+1 programs are considered undergraduates in years one, two, and three. The fourth, fifth, and sixth year they are considered a graduate student. All institutional awards for undergraduate programs will not be available during years four, five, and six or when you are considered a graduate student.

**Merit-Based Scholarships**

Merit-based scholarships are institutional awards available to full-time, main campus degree seeking students who have demonstrated outstanding academic achievement. Unless otherwise specified, academic awards are renewable for each year a recipient is enrolled (up to four years) while maintaining satisfactory academic progress. At the end of every semester hours earned (Pace) and cumulative GPA's are checked to verify eligibility.

If a student moves off campus, his/her need based grant/scholarships might be adjusted. Other aid can be affected as well. Starting August 2009, students are required to live in campus housing throughout their college career.

**Academic Scholarships**

Scholarship grants to full-time, main campus degree seeking students are based on test scores, either SAT or ACT, and cumulative grade point averages (GPA). The ranges of awards are from $500 up to full tuition for the academic year. Awards are renewable each year that a recipient is enrolled at Trine University as a full-time student (up to four years) and maintains a

satisfactory GPA. Additional details can be found on the Financial Aid website. Awards are available to incoming freshmen and transfer students, both commuters and residents.

**Legacy Awards**

Awards of $2,000 per year are available for full-time, main campus students who are children, grandchildren or siblings of Trine University alumni. This award may be placed on top of no more than two additional scholarships and cannot exceed tuition.

**Need-Based Assistance**

Need-based assistance is available to qualified main campus students who file the Free Application for Federal Student Aid (FAFSA) by the Trine University priority filing deadline of March 1. State of Indiana information is taken from the FAFSA—no separate form is required.

**Federal Grants**

Federal Pell Grants - $605 to $5645
Federal Supplemental Educational Opportunity Grants (FSEOG) - $200 to $4000
(Amounts vary depending upon federal funding.)

Note: The amount of *Federal Pell Grant* funds you may receive over your lifetime is limited by a new federal law to be the equivalent of six years of Pell Grant funding. Since the maximum amount of Pell Grant funding you can receive each year is equal to 100%, the six-year equivalent is 600%.

**State Grants**
Freedom of Choice (FOC) - $200-$7410
Twenty-First Century Scholarship - Up to $7528

Note: Students first entering college in the 2013-2014 academic year will be required to meet certain completion requirements to renew state financial aid awards in 2014-2015. Students receiving the Higher Education Award, the Freedom of Choice Award, or the 21st Century Scholars Award must complete at least 30 credit hours during their first year of college to remain eligible for the maximum financial aid award. A student who completes at least 24 credit hours during his first year will remain eligible for financial aid, but will receive an amount that is less than a student who completes 30 credit hours. More information about these requirements is available at www.in.gov/ssaci.

**Institutional**

Additional awards may be available to a student with extreme economic need, after his/her FAFSA has been received by the March 1 priority deadline. Eligibility requirements and responsibilities for need-based assistance are as follows:

- Student must be a U.S. citizen or an “eligible non-citizen.”
- Student must be accepted for admission to Trine University.
- Student must complete and submit the FAFSA by March 1.
- Student must submit documentation to complete his/her financial aid file by May 1.
- Student must be accepted as a regular student in an eligible program that leads to a degree or certificate.
- Student must be enrolled in the minimum number of credit hours needed to fulfill specific program requirements.
- Student must not be in default on any Title IV loan (Perkins, NDSL, Federal Stafford, GSL, and FSL) or owe a repayment on any Title IV grant (Federal Pell Grant or FSEOG) received for attendance at any institution.
- Student must be registered with the U.S. Selective Service System, if required by law.

# Federal Direct Loan Program

**Stafford Loans**

Students apply for a Stafford loan by first completing the FAFSA. When the financial aid office reviews the FAFSA, the student's eligibility for the Federal Direct Loan is then determined. Upon acceptance of the Direct Loan, a master promissory note (MPN) and an entrance interview form need to be completed.

A Stafford loan can either be subsidized or unsubsidized. A student must be enrolled half-time (6 credit hours) to be eligible and the maximum amount a student can borrow is based upon grade level status.

A subsidized loan is awarded on the basis of financial need. A student must be enrolled half-time to be eligible. The student is not charged interest until repayment begins because the federal government "subsidizes" the interest. These loans have a 10-year payoff and a six-month grace period beginning after the student leaves college, either by graduation or withdrawal from the University. For Direct subsidized student loans borrowed on or after July 1, 2012 and before July 1, 2014, the interest subsidy will not be available during the six-month grace period. This means that interest WILL be charged during the grace period for subsidized loans borrowed during this time period.

If you are a first-time borrower on or after July 1, 2013, there is a limit on the maximum period of time (measured in academic years) that you can receive Direct Subsidized Loans. You may not receive Direct Subsidized Loans for more than 150 percent of the published length of your program. This is called your "maximum eligibility period." Your maximum eligibility period is based on the published length of your current program. You can find the published length of any program of study in the course catalog.

An unsubsidized loan is not awarded on the basis of need. A student must be enrolled half-time to be eligible. The student is charged interest from the time the loan is fully disbursed until it is paid in full. A student can choose to pay the interest while enrolled in school or defer those payments until repayment. These loans also have a 10-year payoff and a six-month grace period beginning after the student leaves college, either by graduation or withdrawal from the University.

**Parent Loans**

The Direct Parent Loan for Undergraduate Students (PLUS) is designed to help parents assist their dependent children with their educational expenses. Parents will need to go through a pre-approval process, which is based on specific credit criteria. There is no grace period with a PLUS loan. The interest rate is fixed at 6.41%. Interest is charged from the date of the first disbursement until the loan is paid in full. The repayment period for a Direct PLUS Loan begins at the time the PLUS loan is fully disbursed, and the first payment is due within 60 days after the final disbursement. Parents must begin paying both principal and interest while the student is still in school. However, for Direct PLUS Loans with a first disbursement date on or after July 1, 2008, the parent may defer repayment either when the student on whose behalf the parent borrowed the loan is enrolled on at least a half-time basis or for an additional six months after the student ceases to be enrolled at least half-time.

# Enrollment Status

Each type of aid requires main campus, day program students to enroll for a certain number of credit hours per semester. Most federal aid requires at least half-time status (six credit hours); state, institutional and private aid requires full-time enrollment (a minimum of 12 credit hours).

All Trine University Institutional Awards are created for 12-18 credit hours. Schedule overloads, or 19 or more credit hours and additional course fees, are the responsibility of the student.

**Maintaining Eligibility**

Currently enrolled students are required to maintain the appropriate grade point average for the award. Students must maintain satisfactory academic progress by completing the required number of credit hours each academic year (see the Trine University Student Handbook) and reapply for aid in the spring for the next academic year.

# Disbursement

All aid is disbursed equally between semesters. (Aid is generally not available during the summer.) Aid is credited to students' accounts in the Business Office. Student loans are credited only after they are disbursed to the student's account. Students who work on campus will receive paychecks every two weeks. (For more information, see the Trine University Student Handbook or trine.edu.)

**Appeals**

Appeals to financial aid decisions can be filed with the Director of Financial Aid, who will present them to the financial review committee. Appeals must be filed in a timely manner.

**Refunds and Repayments**

Students, who withdraw from the University or drop classes during the first 60 percent of a term, may be required to repay some or all of their financial aid. Refund and repayment amounts are calculated based upon a required federal formula to determine how much is to be refunded to the student or refunded back to various federal, state, and institutional programs. (See the Fees section for information about the Tuition Refund Schedule and Residence Refund Schedule.)

Return of Title IV federal regulations require the Office of Financial Aid to review the aid packages of students who officially withdraw or unofficially withdraw from Trine University if they receive any type of federal aid, including federal grants and loans.

Examples of these calculations can be seen in the Office of Financial Aid.

# Student Rights and Responsibilities

Trine University is committed to working with each student to provide the best financial aid package possible. At the same time, each student has the responsibility to apply for the aid and to meet and maintain eligibility requirements. Following is a list of basic rights and responsibilities of the students in regard to financial aid:

- Students must apply for financial aid.
- Financial aid information and counseling will be available.
- Students will be considered for financial aid on a first-come, first-served basis.
- Students will be notified electronically or via postcard of their eligibility for financial aid.
- Students will be informed of the specific type of financial aid, the amount of each type of aid and the conditions to renew each type.
- Students will have the opportunity to review with the Office of Financial Aid the process by which awarded aid was determined.
- Students may request an additional review of their aid package with the Director of the Office of Financial Aid.
- All students who receive financial aid are required to abide by the policies and regulations of Trine University.
- All Trine University financial aid policies and fund rules are either published on our website or available in our office. Aid recipients are required to be familiar with these policies. Information that is unclear should be brought to the attention of a financial aid staff member.
- The Office of Financial Aid will process financial aid requests without regard to race, religious affiliation, gender, age, or disability. All funds are subject to individual student need as well as the availability of funds.
- General information is communicated to students through their student e-mail account and financial aid information is

communicated through their MyTrineFa account. It is recommended that students review their accounts daily. **For new students we use the email that was entered in on the FAFSA but after they receive their student email account we begin to communicate using that one.

- The student has the right to know what types of aid are available. That information is available on both our website and in our offices.
- Students are obligated to advise the Office of Financial Aid of any name, address, or phone number changes. Updating this information through the MyPortal will not update your financial aid records.
- Financial aid recipients are required to notify the Office of Financial Aid of any scholarships, loans, book allowances, employer assistance or other forms of assistance extended to them from sources outside the college. Adjustments of aid may occur as a result.
- The Office of Financial Aid reserves the right, on behalf of the Institution, to review and cancel any award at any time because of changes in a student's financial or academic status, state program rules, federal program rules or any other significant change. Students will be notified of any changes to their aid via an email communication to their Trine email account (refer to ** in #3 for new students). The email will include instructions on how to access MyTrineFA and review the changes. This will only show the changes made to your award notification and not your bill. If you want to know how this change will affect your bill you will need to log into your MyPortal account for that information.
- Financial aid is awarded to a student contingent upon maintaining standards set forth by the institution's Title IV Satisfactory Academic Progress (SAP) policies which complies with required Federal standards. Please refer to our website and/or student handbook for policy details.
- Disbursement of a student's financial aid award(s) (with the exception of CWS- College Work Study) will be in the form of a direct payment to the student's account in the Business Office. Work-study earnings are paid directly to the student on a bi-weekly basis via direct deposit after a job is secured and hours are worked.
- Financial aid will be awarded and disbursed based on full-time enrollment. Should the student register for less than a full-time course load or drop classes that adjusts enrollment, costs and aid will be adjusted and an acknowledgement will be sent to the student via email communication. In some cases, students may be required to repay funds to the University.
- It is the student's responsibility to ensure that their tuition is paid in full by the due date either by financial aid, payment plan, cash or whatever resource they plan to use. Students can check their account status on My Portal.
- The student must complete all application forms accurately and submit them on time to the appropriate location.
- The student must provide correct information. The intentional misreporting of information on financial aid application forms is a violation of the law and is considered a criminal offense which could result in indictment under the U.S. Criminal Code.
- The student must return all additional documentation, verification, corrections, and/or new information requested by the Financial Aid Office in a timely manner. Any delay can affect eligibility for certain types of aid.
- A student receiving federal financial aid earns their aid based on the number of days that they attend class. A recipient who fully withdraws from Trine University before 60% of the term is completed will be subject to an aid recalculation based on the number of days attended. The unearned aid will be refunded to the appropriate federal financial aid program by the institution and the student will repay the institution.
- A student receiving state financial aid earns those funds based on their enrollment at the end of the 28th class day. Therefore state aid will be affected should the student drop all of their coursework or below full-time before that date.
- A student receiving a Federal Pell Grant earns those funds based on their enrollment as a first time bachelor degree seeking student. A student needs to begin enrollment in all of their coursework before Pell Grants will disburse to their student account. Therefore Pell Grants will be affected if you do not begin your enrollment in all of your coursework

and/or drop some or all of the coursework for which you enrolled in.

- A student may be awarded employment under the CWS – Federal Work Study Program. The amount of CWS aid shown on the award letter is the maximum amount of money the student can expect to earn during the academic year as a result of work performed. The student will only be paid for hours worked and obtaining work is contingent on finding CWS approved employment.
- Financial aid awards are made for one academic year only. One half of the award will be applied each semester. It is always the student's responsibility to apply annually for aid; applications submitted by March 1st will receive priority consideration. Renewal of aid depends upon the student maintaining Title IV Satisfactory Academic Progress, continued need for financial aid assistance and the availability of funds.
- Students planning to attend summer semester and wishing to receive financial aid must complete a Request for Summer Aid Form in addition to the FAFSA. Applications are available on-line and in the Office of Financial Aid following spring break.
- Students who are incarcerated in a state or federal correctional institution are required by Federal law to inform the aid office of their incarceration.
- The student is responsible for reading and understanding all forms that he/she is asked to sign and for keeping copies of the forms.
- The student must accept responsibility for all agreements that he/she signs.
- The student must be aware of and comply with the deadlines for application or reapplication for aid.
- The student should be aware of the school's refund policy
- Students receiving financial aid must inform the Office of Financial Aid about additional awards
- Students must maintain satisfactory academic progress toward academic goals.
- Students must maintain good social standing.
- Students must reapply for financial aid between January 1 and March 1.
- Students must report to the Office of Financial Aid when transferring to another school.
- If applicable, students must participate in the Federal Stafford Loan entrance and exit interviews.

# Student Services

In addition to the information regarding student services provided below, the Student Handbook provides a wide range of information for students.

## Housing Requirements

Trine University students, beginning with students entering in the fall of 2009, are required to live on campus. Students who are married, responsible for a dependent child, living at home with a parent or legal guardian (within 50 miles of Angola), or 21 years of age on or before the first day of fall classes may be waived from this requirement. Students with a cumulative GPA of a 2.0 or higher and have completed 60 credit hours and lived on campus for four semesters may be approved to move into a University recognized Sorority/Fraternity House or Christian Campus House. Students who are married and under 21 years of age on or before the first day of fall classes must show a marriage license and live with the spouse in a permanent location within 50 miles from Angola, IN. In addition, International students must show dependent I-20 or dependent DS-2019. Students who are responsible for a dependent child and under 21 years of age on or before the first day of fall classes must show a State issued birth certificate.

Students are required to be enrolled full-time (12 credit hours per semester) to reside in university housing. Students must have the written approval from the Dean of Student Services prior to moving off campus. Failure to receive approval or providing false information may lead to expulsion from Trine University.

All residential students: A signed Residential Room and Board Contract, Housing Information Form, and Housing Deposit are required before arriving on campus. The Residential Room and Board Contract is binding for the entire academic year. If the Residential Room and Board Contract is broken or if permission from the Dean of Students has not been given to be released from the contract, the Housing Deposit is forfeited and a contract release fee will be assessed.

Additionally, any student leaving on–campus housing without a contract release may be subject to billing for the entire contract period. Falsification of housing arrangements may lead to expulsion from the University.

University residence room contracts are available online. Students must complete and submit their housing contracts and non-refundable enrollment deposits to the Office of Admission by the National Candidate Reply Date of May 1 for full-time admission. Request for an extension must be made in writing. For more information on housing requirements the “Student Services” section on the web at trine.edu.

**Residential Facilities**

Residential facilities at Trine University include men only traditional residence halls, women only traditional residence halls, and co-ed apartment buildings. Villas are available for juniors and seniors, and are assigned based on combined academics and social standing. Applications are processed in the spring for the next academic year.

Whitney Commons dining facility in the University Center serves all residential students. A commuter meal plan is available for students not living on campus. The campus Mail Center and student mailboxes are also located in the University Center and serve all of the residential facilities.

**Personal Property Insurance**

Trine University will not reimburse students for damage to personal items as a result of theft, fire, flood, and other disasters. Personal items must be covered by personal insurance.

## Counseling Services

The purpose of Counseling Services is to provide students with short-term counseling that will enable them to overcome a variety of personal and interpersonal difficulties that may interfere with their pursuit of academic and career goals. Clinical

counseling services, as well as prevention, outreach, and consultation, are provided free on the residential Angola campus.

If your anxiety or worry is feeling overwhelming, seek additional help from our office counseling@trine.edu to find out more information or to schedule an appointment.

# University Disciplinary Review Board Process

Information regarding disciplinary processes can be found in the Student Handbook.

**Student Formal Complaint Procedure - "Notice of Complaint"**

"Concerns" are issues that may be solved by informal means; "complaints" are formal issues that cannot be solved informally. Students are urged to have a direct and informal approach for settling concerns. Students are encouraged to voice concerns with the support, involvement and/or intervention of university personnel.

If concerns are not handled in a satisfactory manner, then students are urged to file a "Notice of Complaint." The "Formal Complaint Form" tab is located on the students' myPortal page along with all similar student information. It is convenient to all students, located in a place specifically designed for student information. Further information instructs students not to use the site for Title IX allegations and redirects them to the appropriate page.

**The Complaint Process**

There are four steps to the complaint process:

1. Notice of Complaint

The Notice of Complaint should be filed via the online form available on MyPortal. The complaint form includes all appropriate information for the complaint to be processed.

2. Referral

Once submitted, the complaint is forwarded to the Office of Academic Affairs which determines which area of the University is involved. A representative from that Office forwards the complaint to the appropriate vice president or administrator for action. To ensure confidentiality, only the Office of Academic Affairs, members of the President's cabinet, and the designated administrator have access to the complaint information.

3. Solution.

The administrator meets with the student and discusses solutions to the complaint. All support materials must be provided to the administrator by the student. Action must be taken within 10 class days of receiving the notice. A response letter, indicating the solution to the complaint, will be sent by the administrator to the student. Information on the complaint database is also submitted.

4. Appeal.

If the solution is not satisfactory, students may appeal the result within 10 class days of receiving the letter. If filing an appeal, the appeal must be filed within 10 class days of receiving the response letter.

# Campus Life

For information on the following, please see the current Student Handbook.

- Student Organizations
- Professional Societies & Fraternities
- Honor Societies & Fraternities
- Greek Life
- Special Interest Groups

- Athletics
- Intramural Sports

# Vicki Moravec Honors Program

The mission of the Vicki Moravec Honors Program is to provide support, resources, and academic experiences to high achieving and highly motivated students, thus allowing them to grow intellectually and become active independent learners. A student in the Vicki Moravec Honors Program would be exposed to a breadth of teaching methods and topics and, through this exposure, will have a more fulfilling and varied educational experience.

**Admission Requirements**

First-year students accepted to any Trine University program with a minimum SAT of 1290/ACT 27 and a High School GPA of 3.75 or higher will be invited into the honors program. If a student is test optional, GPA of 3.75 or higher and AP/honors high school classes will be considered. If the student is invited to Scholarship Day, they will be invited into the honors program. Students that qualify will receive an Intent to Participate form, and they need to complete the online form to be accepted. Current Trine University freshmen or sophomores may also apply for admission into the honors program. These students must notify the Vicki Moravec Honors Program Director of their intentions, have a current Trine University GPA of 3.50 or higher, and must submit a letter of recommendation from a Trine University faculty member. Decisions regarding admission will be made on a case-by-case basis as space allows.

**Program Requirements**

Students may choose to complete either the Honors Program or the Honors Program with Distinction. Students must maintain a 3.50 GPA to successfully earn their Honors Degree.

Honors Program:

- 12 points in Honors coursework
- 30 points in service or leadership experiences

Honors Program with Distinction:

- 12 points in Honors coursework
- 30 points in service or leadership experiences
- Honor Project – approved research or extended service opportunity

**Honors Courses/Contract Courses (12 points)**

All honors students are required to take the following courses for 3 points:

HNR 121 – Introduction to Honors

HNR 200/201 – Sophomore Honors Seminar

HNR 300/301 – Honors Enrichment Trip

Honors students are required to compile at least 9 other points with any combination of dedicated HNR courses, honors sections of regularly offered courses, or contract courses in their departments. Contract courses (any 200-level course or above) are a regularly offered Trine University course in which the instructor and honors student agree on additional requirements to enrich the experience. For HNR courses and honors sections of courses, the credits for each course will directly correlate to the number of points earned. Contract course points will vary depending on the degree of extra work involved.

**Honors Service/Leadership Experiences (30 points)**

Honors students are required to complete service and/or leadership hours. Students will earn 1 point per documented service

hour, which can be completed on or off campus. Students will earn 3 points per term for serving on any campus association board, peer tutoring, and other campus leadership roles. Honors students need a total of 30 points to successfully earn their Honors Degree.

**Honors Project**

Honors Program with Distinction students are required to complete an Honors Project. Activities that qualify for an Honors Project include an original Honors Thesis, a semester of study abroad, or elaboration of a capstone project to include Honors Program requirements. All Honors Projects must receive approval from the honors program advisory board. Honors Projects will culminate in a written paper as well as a presentation at the Honors Symposium held at the end of the spring semester.

**Academic Performance**

To participate in the Vicki Moravec Honors Program, a student must maintain a 3.50 cumulative grade point average at the end of each academic year. A student whose GPA falls below 3.50 will be placed on probation in the Honors Program and will have one semester to raise his/her GPA.

# ROTC – Air Force Reserves Officer Training Corps

The Air Force Reserves Officer Training Corps (ROTC) is an educational program designed to give men and women the opportunity to become Air Force officers while completing their degrees. The Air Force ROTC Program develops leadership and management skills students need to become leaders in the 21st Century. In return for challenging and rewarding work, ROTC offers the opportunity for advancement, education and training, and the sense of pride that comes from serving your country. Upon completion of the Air Force ROTC program, students are commissioned as second lieutenants in the United States Air Force. Following commissioning, there are excellent opportunities for postgraduate study in a wide variety of academic fields.

In accordance with the Crosstown Agreement with Detachment 225 at the University of Notre Dame, Trine University students may participate in ROTC by travelling to South Bend one afternoon and evening per week for coursework. Additional information can be found at trine.edu.

# Study Abroad Program

Travel opportunities offered through Trine University open students' eyes, hearts, and minds to the world beyond campus. Exploring diverse cultures, living away from home, and viewing the world from a fresh perspective helps Trine University students integrate their academic studies and international experiences into a larger perspective of the world.

Through Trine University's direct affiliation with International Studies Abroad (ISA), students can participate in affordable summer, semester, or year-long programs in Argentina, Australia, Belgium, Brazil, Chile, China, Colombia, Costa Rica, Czech Republic, Dominican Republic, England, Fiji, France, Germany, Greece, India, Ireland, Italy, Japan, Jordan, Morocco, New Zealand, Peru, Scotland, South Africa, South Korea, Spain, Thailand, and Turkey. Internships and study plus internship abroad combo options are also available at selected destinations. Further details including the cost, duration, dates, institutions, and course can be accessed at https://studiesabroad.com.

In addition, Trine University has institutional agreements with universities in Italy, France, Bulgaria, Honduras, China, Greece, and Japan. Most study aboard programs require that the student's cumulative grade point average be at least 2.5 and some require at least 3.0.

For further information regarding all opportunities and scholarships, please visit https://trine.edu/academics/academic-programs/study-abroad.aspx.

# Career Services

Career Services offers programs and services to assist students and alumni to make career decisions and pursue the skill development necessary to compete in a rapidly changing, competency-based, global workplace. Career planning is an on-going process that begins when the student is a freshman and continues throughout the student's senior year. The office of Career Services works collaboratively with academic departments, faculty members, student services, employers and other relevant constituents to enhance students' career development and participation in internships and other experiential education programs. Career Services accumulates and makes accessible information and resources pertaining to career exploration, workforce trends, the job search, employment opportunities, current salary trends, and graduate employment statistics. The resources of Career Services are available throughout the student's academic preparation and when the student becomes an alumnus.

***Job placement is not guaranteed to students upon graduation.**

**Employment Assistance**

Students are offered advice and coaching for procuring major-related internships, cooperative education assignments, and full-time employment. Career Services facilitates communication between job seekers and employers, which includes hosting career fairs, networking events, guest speakers, and arranging student interviews for representatives of business, industry, and educational institutions who visit campus to recruit prospective employees. Career Services also reaches out to relevant individuals, campus offices, alumni, and external agencies to establish and maintain effective relations, disseminate information about programs and services, and increase experiential learning and employment opportunities for the benefit of Trine University students.

## Internships

Career Services advertises internship requests throughout the academic year on www.trinecareers.org and refers students to other internship resources that meet their individual needs. These major-related work experiences, which usually are limited to a three-month time period, build credentials that are essential to a graduate's job search. Internships for credit are also available for students who meet specific requirements within the student's discipline or major field of study.

## Cooperative Education Program

The Cooperative Education Program (co-op) is a course that promotes professional learning and enhances traditional university course and lab work. The Cooperative Education Program is designed to allow students to alternate full-time work with an employer and campus sessions. This experience not only better prepares the student for entry into his/her chosen field, it allows students the opportunity to network with professionals and make industry contacts. Another advantage is that co-op students can earn a salary while on work assignments, enabling them to finance a portion of their education. Students eligible for the Cooperative Education Program must have completed a minimum of 30 semester hours with a 2.4 cumulative grade point average and must meet criteria established by the prospective employer.

A student is considered a cooperative education student after having accepted employment with a cooperative education employer, after the Cooperative Education Director and Department Chair have approved the student's program, and after the student has registered for the course CO 050 Co-op Employment. Work experience prior to acceptance into the Cooperative Education Program cannot be applied to the program.

A cooperative education student must complete a minimum of three semesters of work assignments. Approval of any changes in the alternating employment/class schedule must be obtained in writing from the cooperative education company, the Cooperative Education Director, and the respective Department Chair. This approval should be obtained by mid-term of the semester before the proposed change. Consecutive work periods require separate registration.

A cooperative education student may have a second cooperative education employer only if a co-op position is terminated by the original employer or, in the extreme case, that no major-related experience or progression of responsibilities is occurring.

Verification of major-related experience and progression must be made in writing by the cooperative education student and confirmed by both the Cooperative Education Director and the respective Department Chair.

During or upon completion of the final work assignment, the student must enroll in CO 45X Co-op Work Experience. Students have the flexibility to choose a one, two, or three hour course. Through this course, the student will prepare and submit a comprehensive report on his/her work experience. Upon approval of the finished report, the student will be awarded one (1), two (2), or three (3) hours of academic credit depending on the course completed.

Upon satisfactory completion of both academic and co-op work experience requirements, the cooperative education student will be granted a baccalaureate degree with the inscription "Cooperative Education Program," as well as a designation on his/her transcript noting cooperative education participation.

# Work Study Employment

Federal Work-Study is awarded to undergraduate students who demonstrate financial need. The award ranges from $250 to $2,000 per year to help meet their costs of post-secondary education. Work Study is a federally-subsidized program in which wage costs are shared by the federal government and the university.

Work Study positions are hourly-wage jobs in which a student works for an employer according to a mutually agreed-upon schedule and is paid on a bi-weekly basis for the hours worked.

The Office of Financial Aid manages the work study program. There are many different jobs available through the Work Study Program ranging from information technology to athletics, from admission to campus operations. There are many different Work Study categories from which to choose, varying in the areas of interest, degree of difficulty, and wage rate. With a variety of positions available, it is hoped that students will find jobs which are both interesting and related to their career goals.

**How to find a job**

Students participating in the work study program find positions available on campus with which they have interest in. Students are not assigned a position. This allows student to pursue areas of interest to them. All on-campus work study positions are posted on www.trinecareers.org before classes begin in the fall.

# Academic Information

## Classification of Students

For purposes of registration and determination of eligibility for certain student activities, the Registrar uses the following guidelines:

| CLASS | CREDITS EARNED |
|---|---|
| Freshman | 0–28 |
| Sophomore* | 29–59 |
| Junior | 60–89 |
| Senior | 90+ |

*Students enrolled in associate degree programs remain sophomores when they have 60 or more credits earned.

**Undergraduate Course Load**

A full-time undergraduate student is one who is carrying a minimum of 12 academic credit hours. If a main campus student wishes to register for more than 18 credit hours, he or she must have written permission as follows below. Additionally, undergraduates will be charged per credit hour for anything over 18 credits.

- 19–20 credits requires permission from the Department Chair
- 21–23 credits also requires permission from the school Dean
- 24 or more credits also requires permission from the vice president for academic affairs

**Graduate Course Load**

The semester course load of a full-time graduate student is six (6) hours or more. The maximum load for a full-time master's degree student in College of Graduate and Professional Studies is twelve (12) credits hours in any semester. Any master's degree course load greater than twelve (12) credit hours must be approved by the Program Director.

## Credit Hour Policy (Definition of Credit Hour)

The number of credit hours a course is assigned is determined according to the federal semester credit hour definition in which:

1 credit hour = 1 hour* of direct faculty instruction + a minimum of 2 hours out-of-class student work each week for ~15 weeks.

*50 minute class periods are sufficient to meet this requirement.

For the most commonly-offered 3-credit hour course, it is expected that a student will receive the equivalent of 45 hours of instruction and spend a minimum of 90 hours on assigned class work for a total of 135 hours. Please see the chart below for additional credit hour expectations.

| Credit Hours | Hours of Direct Instruction | Hours to Complete Additional Coursework | Total Hours |
|---|---|---|---|
| **1** | 15 | 30 | 45 |
| **2** | 30 | 60 | 90 |
| **3** | 45 | 90 | 135 |
| **4** | 60 | 120 | 180 |
| **5** | 75 | 150 | 225 |

*Determining Credit Hours in Different Delivery Modes*

Trine University offers courses in multiple term lengths and through multiple delivery modes to meet the needs of various student populations. Definitions of those modes can be found elsewhere in the catalog. All courses, regardless of delivery mode, use a standard syllabus of record with standard learning outcomes. The assessment of these outcomes is one method by which the University ensures that instruction provided and student work produced is equivalent across delivery modes. The guidelines below are another.

*Note on Laboratory Courses:*

The policies below refer to standard, lecture or seminar-style courses. Laboratory courses and practica must meet a minimum of two hours per week, or require at least two hours per week of student work. Additional work may be required, as appropriate, at the discretion of the program supervisor.

*Guidelines for Delivery Modes*

- *Face-to-face:*
    - *15 week courses: Adhere to the policy above.*
    - *8 week courses:* Required readings, viewing of/listening to recorded lectures, or engagement in other online/electronic direct instruction methods is expected to equal 15 hours per credit hour. Students' work, including the completion of assessment activities and other assignments is expected to equal 30 hours per credit hour.
- *Online:* These courses can meet for meet for 8 or 15 weeks. Required readings, viewing of/listening to recorded lectures, or engagement in other online direct instruction methods is expected to equal 15 hours per credit hour. Students' work, including the completion of assessment activities and other assignments is expected to equal 30 hours per credit hour.
- *Hybrid courses, distance learning courses, and those offered as independent study:* regardless of term length, are required to meet the policy expectation of 15 hours of direct instruction per credit hour, using any combination of face-to-face instruction and methods utilized in online courses. These courses are also expected to require 30 hours of additional student work per credit hour.

*Note on Undergraduate Summer Terms*

During the summer, one 12-week summer term and two 6-week summer terms are offered. Face-to-face, 12-week courses meet for a minimum of 3 hours per week. Six-week courses meet a minimum 6 hours per week.

It is expected that faculty will engage students through live platforms (phone calls, email, discussion board postings, virtual meeting software, etc.) in order to reach the requisite 15 hours of direct faculty-student interaction per credit hour. A 3-credit hour course (either 6 or 12 weeks in length) will require an additional 9 hours of live-platform direct instruction.

*Note on International Partnerships:*

Classes taught with international partner institutions through the Office of Global Partnerships adhere to the term lengths of those institutions. Standard Trine syllabi of record are used and standard learning outcomes assessed to ensure that instructional

time and student work is substantially equivalent.

# Distance Learning

Trine University prides itself on the quality of the education we provide. All curricula, whether delivered online, seated or in hybrid format, follow the same approval process involving faculty, the Vice President for Academic Affairs, the President, and when appropriate the Board of Trustees. Trine courses, whether taken at one of our locations, on the main campus or online, are considered equal.

Seated courses are taught in a face-to-face classroom setting. The syllabus, course schedule, and other materials are to be posted online and students may be asked to submit some work electronically. However a number of distance learning modes are available. Distance Learning (DL) includes fully online or blended courses and is a formal educational process in which the majority of the instruction (interaction between students and instructors and among students) in a course occurs when students and instructors are not in the same place. Instruction may be synchronous or asynchronous. Interaction between the instructor and the student is regular and substantive. Distance Learning (DL) includes various delivery methods.

**Delivery Mode**

Delivery Mode is the primary method or technology used to deliver instructional information to the student and used for communication between the instructor and the students. At Trine University, courses are delivered in the following modes:

1. DL - Online courses are taught 100% online through the main use of asynchronous activities providing greater flexibility of schedule and convenience of access to students, while allowing them to meet the same learning outcomes and level of rigor achieved in seated courses. The delivery of online exams will follow university-approved processes. Some online courses also include the authentication of online test takers and the use of online proctoring tools or live local proctors.
    a. Respondus LockDown Browser is a custom web browser that “locks down” the testing environment within Moodle LMS. Once inside LockDown Browser, students are prohibited by the software from printing, copying & pasting, visiting external websites, and accessing other software applications during the examination process. Any open software applications which LockDown perceives as intrusive to the exam process (i.e. Skype, AOL Instant Messenger, etc.) are required to be closed before the examination process is allowed to proceed.
2. DL - Hybrid courses take advantage of the best features of seated classroom instruction and online education. Students meet face-to-face for a portion of the course and complete the rest of their coursework online. A hybrid course is not simply an online course that requires in-class exams. Hybrid courses allow faculty and students both the opportunity to build strong personal relationships through face-to-face interaction and the opportunity to explore new types of learning activities that were not possible in seated courses. Dates, times and locations for face-to-face meetings will be published in the official course schedule.
3. DL - Video Conferencing courses are taught face-to-face (either in person or via videoconference) in classrooms specially equipped that allow live interaction between the instructor and students even though they may be in classrooms in different geographic locations or remote campuses. Dates, times, and locations for class meetings will be published in the official course schedule.

# Course Audit

To audit is to take a course for no credit. A course may be audited only if space is available in the course. The approval of the student’s academic advisor is required. A change to credit status is permissible if completed during the normal add period. Auditors shall receive a grade of “AU.” At the discretion of the instructor, an auditor may participate in class discussion and take examinations. An auditing fee will apply.

# Academic Advising

Each student is assigned a faculty advisor who assists the student in planning a program to meet graduation requirements and

career goals. It is, however, the student's responsibility for meeting the academic program requirements presented in the catalog.

# General Education Requirements

**General Education Philosophy**

The purpose of the general education curriculum components is to provide the Trine University graduate with skills necessary to think critically and to communicate clearly with persons in all professions. The General Education requirements are designed to ensure breadth of knowledge and to promote intellectual inquiry.

**Learning Outcomes**

1. Formal Writing: Communicate ideas using text, data, and images as appropriate, to effectively address specific audiences within their given context(s).
2. Interpersonal Communication: Communicate orally within various face-to-face interpersonal contexts employing relevant verbal and nonverbal strategies.
3. Data Literacy: Demonstrate data literacy, including how to read graphs and charts appropriately, draw correct conclusions from data, and recognize when data are being used in misleading or inappropriate ways.
4. Synthesis: Reflect on how mathematics, scientific, humanistic, and social science study work together to prepare them for leadership and service.

**General Education Distribution Requirements**

The University believes that attainment of the skills described in the General Education Philosophy requires exposure to and some facility with the modes of inquiry practiced in multiple disciplines. Thus, all students, regardless of academic program, are required to take courses within the fields of Humanities, Natural Sciences, Social Sciences, and Mathematics. To determine which courses fall within each discipline, Trine has adopted the guidelines of the American Academy of Arts and Sciences' "Humanities Indicators" project. Trine differs from the Academy in classing history as a social science.

- **Humanities incorporates the following disciplines:** The academic study of the arts including art history; music; drama and cinema; communication; cultural, ethnic, and gender studies; English language and literature; and languages and literature other than English.
- **Natural Sciences address the following areas of study:** astronomy, chemistry, geography, geology, earth science, physics, anatomy and physiology, botany, biology, microbiology, and molecular bioscience.
- **Social Sciences incorporate the following disciplines:** economics, geography, government, international relations, political science, psychology, sociology, and urban studies.
- **Mathematics** courses include college level mathematics and statistics.

# CHAT (Culture, Humanities, and the Arts at Trine)

Main Campus graduation requirement: Students must attend eight university-approved CHAT events over the course of four years, or one per semester while enrolled, with no limitations on the number of events per semester. Transfer students are required to attend a prorated number of events, dependent upon the number of semesters they are enrolled, at one per semester.

The CHAT events requirement relates to the university's mission in that CHAT events are co-curricular experiences that cultivate the holistic development of students. Examples of CHAT events include the following:

- Multicultural events
- International events

- Musical performances, recitals, and concerts
- Dance performances
- Theater productions
- Art exhibits
- Readings in prose or poetry
- Humanities & Communication Department sponsored events
- Lectures, seminars, and symposia on a range of culturally-related themes
- University approved exhibits at cultural institutions

## All Bachelor Degrees General Education Requirements (30 hrs.)

| **Area** | Credit Hours |
|---|---|
| **Communication (9 hrs.)** | |
| ENG 133 or ENG 143 | 3 |
| HUM 203 | 3 |
| COM 163 or SP 203 | 3 |
| | |
| **Humanities & Social Science (9 hrs.)** | |
| 3 hours of Humanities | 3 |
| 3 hours of Social Science | 3 |
| 3 additional hours of Humanities or Social Science | 3 |
| | |
| **Mathematics & Science (9 hrs.)** | |
| 3 hours of Mathematics | 3 |
| 3 hours of Science | 3 |
| 3 additional hours of Mathematics or Science | 3 |
| | |
| **Other[1] (3 hrs.)** | |
| 3 additional hours of general education courses | 3 |
| **TOTAL CREDIT HOURS:** | **30** |

**Other[1]**
EXS 102 Lifetime Wellness may be used to satisfy two hours of "Other" General Education requirements.

HNR 121 Introduction to Honors Seminar may be used to satisfy one hour of "Other" General Education requirements.

BA 113 Business Computer Applications, CSIT 103 Introduction to Information Systems, or any approved computer literacy course may be used to satisfy three hours of "Other" General Education requirements.

**Foreign Language Policy**

In order for a student to register for a first-year foreign language course, the student must not be a native speaker of that language.

**CHAT (Culture, Humanities, and the Arts at Trine)**
Main Campus graduation requirement: Students must attend eight university-approved CHAT events over the course of four years, or one per semester while enrolled, with no limitations on the number of events per semester. Transfer students are required to attend a prorated number of events, dependent upon the number of semesters they are enrolled, at one per semester.

## Associate Degrees General Education Requirements (18 hrs.)*

| **Area** | **Credit Hours** |
|---|---|
| **Communication (6 hrs.)** | |
| ENG 133 or ENG 143 | 3 |
| And one of the following: | |
| HUM 203 | 3 |
| COM 163 | 3 |
| COM 213 | 3 |
| SP 203 | 3 |
| | |
| **Humanities & Social Sciences (6 hrs.)** | |
| 6 hours, combined, of Humanities and Social Science | 6 |
| | |
| **Mathematics & Science (6 hrs.)** | |
| 6 hours, combined, of Mathematics and Science | 6 |
| **TOTAL CREDIT HOURS:** | **18** |

***Except those in Applied Science**

**Foreign Language Policy**
In order for a student to register for a first-year foreign language course, the student must not be a native speaker of that language.

**CHAT (Culture, Humanities, and the Arts at Trine)**
Main Campus graduation requirement: Students must attend eight university-approved CHAT events over the course of four years, or one per semester while enrolled, with no limitations on the number of events per semester. Transfer students are required to attend a prorated number of events, dependent upon the number of semesters they are enrolled, at one per semester.

# Associate in Applied Science Degrees General Education Requirements (15 hrs.)

| Area | Credit Hours |
|---|---|
| **Communication (6 hrs.)** | |
| ENG 133 or ENG 143 | 3 |
| And one of the following: | |
| HUM 203 | 3 |
| COM 163 | 3 |
| COM 213 | 3 |
| SP 203 | 3 |
| | |
| **Humanities & Social Sciences (3 hrs.)** | |
| 3 hours of either Humanities or Social Science | 3 |
| | |
| **Mathematics & Science (6 hrs.)** | |
| 6 hours, combined, of Mathematics and Science | 6 |
| **TOTAL CREDIT HOURS:** | **15** |

**Foreign Language Policy**
In order for a student to register for a first-year foreign language course, the student must not be a native speaker of that language.

**CHAT (Culture, Humanities, and the Arts at Trine)**
Main Campus graduation requirement: Students must attend eight university-approved CHAT events over the course of four years, or one per semester while enrolled, with no limitations on the number of events per semester. Transfer students are required to attend a prorated number of events, dependent upon the number of semesters they are enrolled, at one per semester.

# Humanities and Social Sciences for Bachelor and Associate Degrees General Education Requirements

General education requirements for all Bachelor and Associate Degrees include humanities and social science courses. Use the list below to complete the humanities and social science general education requirements.

| **HUMANITIES** | | **SOCIAL SCIENCES** | |
|---|---|---|---|
| ARC 293 Architecture Appreciation | GER 104 German I | COM 123 History of Media | POLS 343 Amer Political Thought |
| ART 253 Art Appreciation | GER 114 German II | ECO 203 Survey of Economics | POLS 363 US Foreign Policy |
| CHN 113 Chinese I | GER 203 German III | ECO 213 Microeconomics | POLS 373 Political Psychology |
| CHN 123 Chinese II | GER 213 German IV | ECO 223 Macroeconomics | POLS 403 Amer Constitutional Dev |
| COM 203 Media & Society | HIS 253 Japanese People | EDU 222 Educational Psych Elem | POLS 423 US as a World Power |
| COM 233 Intercultural Communication | HNR X1X Honors Humanities | EDU 232 Educational Psych Sec | PSY 113 Princ Psychology |
| COM 363 Rhetoric & Persuasion | HUM 173 Visual Storytelling | EDU 273 Issues Amer Education | PSY 223 Life Span Development |
| ENG 153 Intro to Literature | MUS 123 Music History I | GEO 213 Physical Geography | PSY 313 Topics in Psychology |
| ENG 233 Mythology | MUS 223 Music History II | GEO 303 Human Geography | PSY 323 Abnormal Psychology |
| ENG 253 Global Literature | MUS 272 Music Appreciation | GEO 313 Geography North Amer | PSY 333 Psych of Personality |
| ENG 263 Contemporary Themes in Lit | MUS 273 Music Culture | GEO 323 World Geography | PSY 343 Social Psychology |
| ENG 273 Creative Writing | PHL 203 Intro to Philosophy | HIS 103 American History I | PSY 353 Child & Adolescent Psych |
| ENG 333 Studies in Literature | PHL 213 Theories & Phil Soc Innovation | HIS 113 American History II | PSY 353 Child & Adolescent Psych |

| | | | |
|---|---|---|---|
| ENG 363 English Language | PHL 251 Ancient Greece | HIS 203 World Civilization I | PSY 373 Political Psychology |
| ENG 423 Drama | PHL 313 Ethics | HIS 213 World Civilization II | PSY 383 Forensic Psychology |
| ENG 433 Shakespeare | PHL 323 Philosophy of Religion | HIS 251 Ancient Greece | PSY 3013 Health Psychology |
| ENG 443 Poetry | PHL 333 Art, Society & Technology | HIS 263 Indiana History | PSY 3023 Cross Cultural Psychology |
| ENG 2013 British Literature I | PHL 343 Logic | HIS 323 Contemporary World | PSY 403 Human Sexuality |
| ENG 2023 British Literature II | SPN 103 Spanish Conversation I | HIS 343 American Political Thought | PSY 413 Psychology of Addiction |
| ENG 2113 American Literature I | SPN 113 Spanish Reading & Writing | HIS 353 Civil War & Reconstruction | PSY 443 Adv Forensic Psych |
| ENG 2123 American Literature II | SPN 123 Spanish II | HIS 363 US Foreign Policy | SI 213 Theories & Phil Soc Innovation |
| ENG 2513 World Literature I | SPN 203 Spanish III | HIS 403 Amer Constitutional Dev | SM 393 Sport Psychology |
| ENG 2523 World Literature II | SPN 213 Spanish IV | HIS 423 US as a World Power | SOC 103 Princ Sociology |
| ENG 3303 Bible as Literature | SPN 303 Spanish Language | HIS 433 American Revolution | SOC 313 Topics in Sociology |
| FLM 203 Film Appreciation | SPN 303 Spanish Language | HNR X2X Honors Social Science | SOC 323 The Family |
| FRN 113 French I | SPN 313 Spanish Writing & Conversation | POLS 113 Intro Government | SOC 333 Art, Society & Technology |
| FRN 123 French II | SPN 323 Spanish Culture | POLS 313 Comparative Governments | SOC 343 Social Psychology |
| | THE 103 Intro to Theatre | POLS 323 Contemporary World | WS 103 Intro Women's Studies |

| | | | |
|---|---|---|---|
| | | POLS 333 State & Local Govern | |

# Class Attendance and Excused Absences

This policy does caution that within the University there are several categories of students that are expected to exhibit behavior that conforms to the group to which they belong. These units include, but are not limited to, ROTC cadets, academic honor societies, veterans, athletes, medicine, and nursing majors. Membership within these units implies that the student agrees to fulfill the obligations of the organization.

# Angola Campus

Students are expected to attend all class and laboratory sessions. Absences may be permitted for reasonable causes, including but not limited to, illness, disabling injury, death or serious illness in the immediate family. Participation in University-sponsored activities shall also constitute a reasonable cause for absence from class. Written documentation of the reason for absence may be required and, in the case of University-sponsored events, such documentation will be provided by the University sponsor.

It is the student's responsibility to discuss pending absences (field trips, athletic competitions, etc.) with his/her professor prior to the missed class period. The faculty member may require the student to complete any work due prior to the absence. Class or team lists distributed via e-mail do not excuse a student from class or laboratory sessions, but rather provide confirmation to the faculty member that the activity is indeed University-sponsored.

If there is a death in the immediate family, please contact the Office of Student Success and Retention. Under these circumstances a student will be excused from class attendance for up to seven calendar days. When the student returns to class he/she should confer with the professor.

It is the instructor's responsibility to present a class attendance policy to each class at the beginning of the semester. Decisions regarding submittal of assignments will be at the instructor's discretion, but students may not be penalized for absences due to reasonable cause.

Online courses follow the CGPS attendance policy.

# College of Graduate and Professional Studies

**Trine Online (TOL) Courses**

In the case of an online class active participation as gaged by the instructor is required. Once a student misses three sessions of any one class, prior to the withdrawal deadline, he/she will be dropped from the course with a "W". Only in the event of rare and unusual circumstances, with formal documentation, will a student be allowed to continue.

**Graduate Courses**

All students are expected to abide by the attendance policy set forth by the instructor in each class. Attendance may be registered at the beginning, end of class or on return from break; and may be deducted for tardiness. Lack of attendance may impact course grades and Academic standing. Should more than 2 unexcused absences accumulate the student will be academically dropped from the course. When possible, students must provide advance notice of absences, as well as relevant documentation regarding absences, to the instructor as soon as possible following the illness or event that led to the absence. Any arrangement to make up work because of class absence is the responsibility of the student. The instructor, who will explain the evaluation (grading) statement at the beginning of the term, determines the effect of absences upon grades.

Students enrolled in hybrid/seated classes that require only one meeting day per semester/term are required to attend the entire day scheduled for the seated component of the course. Students who are absent from this scheduled meeting for any portion of

the day will be administratively withdrawn from the course.

# Grades and Grading Information

## Undergraduate Grading System

The grading system with honors points is as follows:

| | | |
|---|---|---|
| A | Excellent | 4.0 |
| B+ | Very Good | 3.5 |
| B | Good | 3.0 |
| C+ | Above Average | 2.5 |
| C | Average | 2.0 |
| D+ | Below Average | 1.5 |
| D | Poor (lowest passing grade) | 1.0 |
| F | Failure | 0.0 |
| FI | Failure (original grade of I) | 0.0 |
| TR | Transfer Credit | not figured into GPA |
| S | Satisfactory (grade of C or higher) | not figured into GPA |
| U | Unsatisfactory (grade of D+ or lower) | not figured into GPA |
| I | Incomplete | not figured into GPA |
| IP | In progress (grade deferred) | not figured into GPA |
| W | Withdrawal before completion of 80% of the semester | |
| WP | Withdrawal after completion of 80% of the semester with passing work at the time of withdrawal | |

The grade point average is calculated by dividing the honor points by the GPA hours.

# Graduate Grading System

The grading system is as follows*:

| | | |
|---|---|---|
| A | Excellent | 4.0 |
| B+ | Very Good | 3.5 |
| B | Good | 3.0 |
| C+ | Above Average | 2.5 |
| C | Average (lowest passing grade) | 2.0 |
| F | Failure | 0.0 |
| I | Incomplete | not figured into GPA |
| IP | In progress (grade deferred) | not figured into GPA |
| TR | Transfer Credit | not figured into GPA |
| S | Satisfactory (grade of C or higher) | not figured into GPA |
| U | Unsatisfactory (grade of D+ or lower) | not figured into GPA |
| W | Withdrawal before completion of 80% of the semester | |
| WP | Withdrawal after completion of 80% of the semester with (passing work at the time of withdrawal) issued only under special circumstances and with the approval of the Department Chair/Program Director. | |

*Except the Master of Physician Assistant Studies Program

**Master of Physician Assistant Studies Grading System**

Effective beginning with the Fall 2020 Cohort the Master of Physician Assistant Studies Program will use an "Honors/Pass/Fail" grading system for all phases of the curriculum.

| | | |
|---|---|---|
| H | Honors | 95% and above |
| P | Pass | 81% and above |
| F | Fail | 80% or below |
| I | Incomplete | not figured into GPA |
| IP | In Progress (grade deferred) | not figured into GPA |
| W | Withdrawal before completion of 80% of the semester | |
| WP | Withdrawal after completion of 80% of the semester with (passing work at the time of withdrawal) issued only under special circumstances and with the approval of the Department Chair/Program Director | |

The grade point average is calculated by dividing the honor points by the GPA points.

# Course Repeat

**Course Repeat**

A student may retake a course at Trine University; however, no more than two courses may be retaken during the student's course of study. The number of repeated courses may be further limited by individual departments, and scheduling constraints may impact the length of the program.

Whenever a course is repeated on a credit basis, the higher grade and credits earned completely replace the previous grade in the satisfaction of requirements and computation of cumulative grade-point average. All entries remain a part of the student's permanent academic record.

Course repeat means that a student may retake a course at Trine University for a better grade. When a student has repeated a course, the honor points for the higher grade are substituted in the cumulative grade point average.

The student's record will not show additional hours attempted for the repeated course. Additional earned hours are given if a student passes a class where an "F" or "U" grade was originally received. Courses which are repeated remain on the student's permanent record (transcript).

# Failing Grades

**Failing Grades**

Credit for a course failed at Trine University may not be obtained by examination.

# Grade of Incomplete

**Grade of Incomplete**

(Issued only under special circumstances)

Incomplete ("I") is a temporary grade used by the instructor in cases where a student is unable to complete course requirements because of circumstances beyond the student's control such as illness, family emergency or other similar circumstances. It is assigned only if the student has satisfactorily completed the major portion of the course requirements and has convinced the instructor of his or her ability to complete the remaining work without registering for the course again. An instructor who assigns a grade of "I" submits to the Department Chair/Director a formal statement of requirements that must be satisfied for removal of the incomplete grade. A copy of the statement of requirements, including deadlines for their completion, shall be made available to the student.

It is the student's responsibility to contact the instructor to make arrangements for completing the remaining work. The required work should be completed and a grade reported by the end of the student's next semester in residence, but in no case later than one calendar year following the receipt of the "I" grade.

An "I" grade not removed for the main campus within one year from the end of the semester in which the "I" grade was issued will be converted to an "FI" grade by the Registrar. For undergraduates in CGPS an "I" grade not removed within eight weeks in which the "I" grade was issued will be converted to an "FI" by the Registrar. An "I" grade may not be removed by registering again for the course.

If the instructor giving the "I" grade is no longer a member of the faculty, the student should contact the Department Chair/Director who will act on behalf of the former instructor. In the case of a graduating senior, if an "I" or "IP" grade is not removed until after the start of the next semester, the graduation date will reflect the new semester.

# Grade of "In Progress"

**Grade of “In Progress”**

The “IP” (In Progress) grade is to be given only in courses so designated by the respective schools. The “IP” grade is designed for courses which require more than one term or semester for completion. An “IP” grade not removed within the agreed upon timeframe will be converted to an “F” by the instructor. An “IP” grade may not be removed by registering again for the course.

Course repeat means that a student may retake a course at Trine University for a better grade. When a student has repeated a course, the honor points for the higher grade are substituted in the cumulative grade point average.

The student’s record will not show additional hours attempted for the repeated course. Additional earned hours are given if a student passes a class where an “F” or “U” grade was originally received. Courses which are repeated remain on the student’s permanent record (transcript).

# Satisfactory/Unsatisfactory

**Satisfactory**

The “S” (Satisfactory) grade indicates that credit has been given for completion of degree requirements other than academic coursework. In graduate programs, this symbol may be used for clinical practicums and internships.

When an “S” (Satisfactory) grade is earned for courses in which credit toward graduation is received, the credit will be counted, but there will be no quality points given. The institutional grade average will thus be determined by the total quality points for those courses in which “A” through “F” grades were given divided by the number of credit hours in which those grades were given.

**Unsatisfactory**

The “U” (Unsatisfactory) grade indicates unsatisfactory performance in an attempt to complete degree requirements other than academic coursework. In graduate programs, this symbol may be used for clinical practicums and internships.

# Withdrawal from Class

A student may withdraw from class through 80 percent of the semester, provided the student obtains the proper form from the Registrar and obtains academic advisor approval. International students must also have the approval of the Registrar or Designated School Official (DSO) if they will be dropping below 12 credit hours for undergraduate and 9 credit hours for graduate. .

All students dropping below full-time status must have the approval of Financial Aid. The completed form shall be submitted to the Registrar before 80 percent of the semester is completed.

No classes shall be dropped after the completion of 80 percent of the semester except for circumstances beyond the control of the student, such as illness, family emergency, or other similar circumstances. Permission to withdraw after the completion of 80 percent of the semester must be obtained from the Chair of the student’s department, Dean, and VPAA. If permission is granted, a grade of “WP” will be issued if the student was passing at the time of withdrawal.

A grade of “F” will be issued if the student was failing and will count toward the student’s cumulative and semester grade point averages. Any deviation from the policy will be considered an unofficial withdrawal, and a grade of “F” will be issued.

# Grade Appeals

The awarding of grades is the prerogative of the classroom instructor. Faculty members are responsible for informing students of their grading policy. Grades become official when they are reported to the Registrar. If a faculty member discovers incorrectly reported grades, the error should be reported to the Registrar immediately. The appropriate Department Chair/Program Director

must approve any adjustment of grades.

A student who disagrees with an assigned grade will take the following steps:

1. Approach the professor and explain the problem.
2. If the professor and student do not come to an agreement, the student should write a letter to the Department Chair/Program Director.
3. If the Department Chair/Program Director mediation does not resolve the issue, the student should file a written appeal to the appropriate academic Dean. For this appeal to succeed, new evidence or a different interpretation of existing evidence would need to be presented by the student.
4. If the Dean mediation does not resolve the issue, the student can make a final appeal by filing a written appeal to the Vice President for Academic Affairs (VPAA). The appeal should set forth in detail the basis for the review and should be done by the midterm of the first regular term following the Trine University assignment of the grade. The student is responsible for presenting evidence to support his/her position. The ensuing decision of the VPAA is final. Records of each case shall be maintained in the office of the VPAA.

# Academic Record and Transcripts

**The Academic Record**

A report of the student's grades earned in all courses taken during a semester is posted online at the end of each term. Grade reports for first year main campus students are mailed to permanent addresses for domestic students and to local addresses for international students.

A permanent record of all the student's courses, credits and grades earned is kept in the Office of the Registrar. The student should maintain a record of courses, credits and grades each term and check from time to time to see that this record agrees with the University version. The official record may also help the student determine eligibility for any activity that requires meeting specific scholastic standards.

**Transcripts**

While attending Trine University a current student may obtain unofficial (personal) copies of his or her University transcript at no charge through the student portal. All official transcripts which bear the Registrar's signature and school seal can be requested at trine.edu/transcripts.

Holds prevent the release of transcripts. Holds may include, but is not limited to, financial indebtedness, student services obligations, or parking citations.

Trine University will not release copies of transcripts from another institution.

# Scholastic Awards - Undergraduate

**Scholastic Awards at the end of Each Semester**

**The President's List**
A student whose semester grade point average is 3.750 or better, while carrying at least 12 undergraduate credit hours, will be placed on the President's List.

**The Dean's List**
A student whose semester grade point average is between 3.500 and 3.749, while carrying at least 12 undergraduate credit hours, will be placed on the Dean's List.

**The Vice President's List**

An undergraduate student who is registered for twelve or more total semester credit hours, including graduate courses, with fewer than twelve credit hours at the undergraduate level, will be considered for Vice President's List recognition. The student must have a semester combined undergraduate/graduate grade point average of between 3.750 and 4.000, with the undergraduate semester grade point average not lower than 3.500.

**Undergraduate Scholastic Awards at Graduation**

# Changing a Major

## Angola Campus

To change a major, students must get the approval of both their current Department Chair and the Chair of the new department.

A student who changes a major is subject to the program requirements in effect at the time of the major change.

When a student changes his or her major, all transcripts, including the Trine University transcript, are evaluated by the new Chair. If the change of major is from one school to another, from a four-year to a two-year program, or from a two-year to a four-year program, courses with less than a "C" grade may be dropped from the student's cumulative totals, if the courses are not required in the new major. This includes students in the Allen School of Engineering and Computing who change from an engineering major to Design Engineering Technology. Dropped courses may not be repeated in the new major.

In cases where a student is readmitted to a school in which he or she was previously enrolled, all grades earned during enrollment in that school must be included in the cumulative grade point average.

Students wishing to change from non-degree status to a degree program should apply for admission through the Office of Admission.

## College of Graduate and Professional Studies

To change a major, students must get the approval of the Program Director or assigned faculty advisor. Admission requirements for each major are available from the Program Director. A student who changes a major is subject to the program requirements in effect at the time of the major change.

When a student changes his or her major, all transcripts, including the Trine University transcript, are re-evaluated. When changing majors, courses with grades of less than a "C" can be dropped from the GPA calculation if one of the following two conditions is met:

1. When changing majors from one category of degrees to another category as follows:

**Category 1:** Business degrees
**Category 2:** Arts & Sciences degrees
**Category 3:** Engineering and Technology degrees

2. When changing from a four-year program to a two-year program or from a two-year program to a four-year program

Additional conditions:

- If courses are not required in the new major.
- Dropped courses may not be repeated in the new major.
- In cases where a student is readmitted to a degree program in which he or she was previously enrolled, all grades earned during enrollment in that degree program must be included in the cumulative grade point average.

## Angola Campus Conditional Students Declaring a Major

Students who do not meet the requirements for admission directly into one of the Trine majors may be granted admission as a

“Conditional” student.

The following requirements must be met before the student can be moved into their desired major:

*Allen School of Engineering and Computing:*

- Minimum of a 2.0 GPA with a “C” in calculus and in composition and a passing grade in chemistry

*Franks School of Education*

- Minimum of a 3.0 GPA over two full-time semesters

*All other schools:*

- Minimum of a 2.0 GPA

# Second Degree, Second Major, and Minors

**Second Degree**

Dual or second degree students are awarded two separate diplomas. To earn a second baccalaureate degree, students must complete all the requirements for both degree programs along with a minimum of 30 credit hours in residence above the degree with the lower minimum hour requirement. Two associate degrees may be received at the same time provided all requirements for both degrees have been met, and the student has earned a minimum of 16 credit hours more than the degree with the lower minimum hour requirement.

A candidate for a Trine University baccalaureate degree who has already earned an associate degree from Trine University must complete a minimum of 46 Trine University credit hours.

**Second Major**

Students who complete a double or second major are awarded one diploma. The two majors will be indicated on the student’s transcript. Students must complete all the requirements for both majors. Most double majors (e.g., criminal justice and psychology) can be completed without additional credit hours. Students should check with their academic department for additional information.

Ketner School of Business students may receive double majors. To receive a double major (e.g., management and finance), a student must meet all requirements in both majors and have a minimum of 135 semester hours of credit. Business electives may count in only one major; a single business elective cannot meet the elective requirements for two business majors. However, a required course in one major can count as an elective in another major.

**Academic Minors (Angola Campus)**

Minors must be declared and are possible with certain degree programs. Students should check with their academic department, if interested. Students are subject to the program requirements in effect at the time the minor is declared.

# Graduation Information

Undergraduate

Graduate

# Undergraduate

1. Specific degree requirements: Students must complete the degree requirements specific to their programs. Once in a program, if the requirements change, students have the option of graduating under the new requirements. Students who re-enter the University after an absence of more than one academic year are subject to the degree requirements in effect at

the time of re-entry.

2. General Education Requirements: All Trine University students receiving a baccalaureate or associate degree must meet the General Education requirements. Details regarding the General Education philosophy and requirements are presented immediately before this section in the catalog.

3. A Trine University cumulative grade point average of not less than 2.0 must be achieved.

4. All required courses or approved substitutions must be completed as described in the respective degree programs. If an "I" or "IP" grade is not removed until after the start of the next semester, the graduation date will reflect the new semester.

5. Candidates for graduation must file with the Registrar, intent to graduate no later than one semester before the final semester of attendance in which degree requirements shall be completed.

6. CHAT (Culture, Humanities, and the Arts at Trine) Main Campus graduation requirement: Students must attend eight university-approved CHAT events over the course of four years, or one per semester while enrolled, with no limitations on the number of events per semester. Transfer students are required to attend a prorated number of events, dependent upon the number of semesters they are enrolled, at one per semester.

**Commencement Participation for Undergraduate Students**

All spring semester and summer semester prospective graduates are eligible to participate in the annual spring commencement ceremony. Fall semester graduates are eligible to participate in the spring commencement ceremony prior to completing their degrees only if, by the end of the spring semester, they have 18 or fewer credit hours to complete to earn their degrees. If a fall graduate has more than 18 credit hours to complete, the student is invited to attend the commencement ceremony the following spring.

**Course Substitutions**

An alternate course may be substituted for one required in a student's major if the student cannot schedule the required course without undue hardship. The substitution must be requested by the student's Department Chair. Proper notation must be made in the student's record and approval granted prior to the substitution. The substitution cannot be made simply on the request of the student to take a different course from the one required.

**Academic Residency Requirement**

To be eligible for a baccalaureate degree, a student must earn a minimum of 30 credits at Trine University. To be eligible for an associate degree, a student must earn a minimum of 16 credits at Trine University. For a baccalaureate degree 30 of the last 60 credits must be earned through Trine University or 16 credits of the last 30 for a two-year degree program. A student must be enrolled in at least one Trine class the last semester prior to graduation.

Undergraduate Graduation Scholastic Awards

## Undergraduate Graduation Scholastic Awards

**Graduation with Honors**
The grids below details the levels of academic honors listed on the student's diploma and transcript.

**Bachelor Degree**

| **LATIN HONORS**<br>*Minimum 40 undergraduate credit hours earned at Trine toward a Bachelor degree* | **GPA** | **ACADEMIC HONORS**<br>*Minimum 30-39 undergraduate credit hours earned at Trine toward a Bachelor degree* | **GPA** |
|---|---|---|---|
| Cum Laude | 3.500-3.749 | Academic Honors | 3.500-3.749 |
| Magna Cum Laude | 3.750-3.949 | High Academic Honors | 3.750-3.949 |
| Summa Cum Laude | 3.95-4.00 | Highest Academic Honors | 3.95-4.00 |

**Associate Degree**

| **LATIN HONORS**<br>*Minimum 20 undergraduate credit hours earned at Trine toward an Associate degree* | **GPA** | **ACADEMIC HONORS**<br>Minimum 16-19 undergraduate credit hours earned at Trine toward an Associate degree | **GPA** |
|---|---|---|---|
| Cum Laude | 3.500-3.749 | Academic Honors | 3.500-3.749 |
| Magna Cum Laude | 3.750-3.949 | High Academic Honors | 3.750-3.949 |
| Summa Cum Laude | 3.95-4.00 | Highest Academic Honors | 3.95-4.00 |

**Honors Day**

For the purpose of recognition at Honors Day, the grade point average requirement will be based upon the student's cumulative GPA before spring grades are posted. Honors will be listed on the diploma and transcript based upon the student's cumulative GPA after the final term's grades are posted and the student has met all degree requirements.

# Graduate

**Graduation Requirements**

Students must have a 3.0 cumulative GPA, complete all necessary program requirements, and carry a grade of C or better in all courses to qualify for graduation.

**Graduate Student Commencement Participation**

Graduate students are eligible to attend the spring commencement ceremony following their degree completion. No graduation honors or honor cords are used for graduate degrees.

**Degrees**

An "Intent to Graduate" form should be filed at the beginning of the master's program. This form will include an expected graduation date and other information pertinent to graduation. All degree requirements must be completed within five years.

# Academic Misconduct

The University prohibits all forms of academic misconduct. Academic misconduct refers to, but is not limited to, the following activities:

- Copying another person's work and claiming it as your own, or submitting the same paper in two different courses without knowledge and consent of the instructor (plagiarism);

- Using the work of a group of students when the assignment requires individual work;
- Requesting or purchasing materials from outside sources not consistent with the expectation of the assignment or assessment.
- Looking at or attempting to look at an examination before it is administered;
- Using materials during an examination that are not permitted;
- Allowing another student to take your examination for you;
- Intentionally impeding the academic work of others;
- Using any electronic device to transmit portions of questions or answers on an examination to other students;
- Using any electronic device to improperly store information for an exam;
- Knowingly furnishing false information to the University;
- Assisting other students in any of the acts listed above.

Moreover, a student is expected to submit his/her own work and to identify any portion of work that has been borrowed from others in any form.

An ignorant act of plagiarism on final versions and minor projects, such as attributing or citing inadequately, will be considered a failure to master an essential course skill and is considered Academic Misconduct. A deliberate act of plagiarism, such as having someone else do your work or submitting someone else's work as your own (e.g., from the Internet, fraternity file, etc., including homework and in-class exercises), is also Academic Misconduct and will result in more serious penalties.

**In situations of Academic Misconduct, instructors have the authority to award a failing grade on the assignment in question or a failing grade for the course. Upon approval by the appropriate Dean, Academic Misconduct may also result in expulsion from the University**

**CGPS Academic Misconduct Process**

# College of Graduate and Professional Studies Academic Misconduct Process

**Level 1**

An ignorant act of plagiarism on final versions and minor projects, such as attributing or citing inadequately, will be considered a failure to master an essential course skill and is considered Academic Misconduct.

- Evidence suggests the offense may have arisen from a temporary panic or from confusion. No evidence suggests that the student or students engaged in sustained or especially serious violation of academic integrity.

**Intervention**

- We Care Alert Filed
- Meet with Faculty, Program Director and Advisor

**Level 2**

Second violation of academic integrity, when the first offense was level 1.

- Evidence suggests Student has made no attempt to improve integrity of work or students engaged in sustained or

especially serious violation of academic integrity.

**Intervention**

- We Care Alert filed
- Failing Grade for Course
- Placed on Academic Integrity Probation
- Must Issue a Personal Improvement Plan
- Notification of Appropriate Parties of Interest
- Meet with Program Director

**Level 3**

A deliberate act of plagiarism, such as having someone else do your work or submitting someone else's work as your own (e.g., from the Internet, fraternity file, etc., including homework and in-class exercises), is also Academic Misconduct and will result in more serious penalties.

- Evidence suggests individual engaged in sustained or an especially serious violation of academic integrity. For example, deliberate plagiarism, purchase of work or cheating on an examination may be in this category.

**Intervention**

- We Care Alert Filed
- Failing Grade for Course
- Immediate Disciplinary Dismissal from Program and University communicated by the Dean of Graduate Studies
- Notification of Appropriate Parties of Interest

**Dismissal Policy**

Once an investigation of factual evidence has occurred and decision to expel reached, by the Dean of Students and Vice President and Academic Affairs, interested parties will be notified of the Disciplinary Dismissal such as:

- Program Director (to facilitate contact):
  - Associated Faculty
  - Director of Campus Safety (Issuance of No Trespass Order)
  - Angola Police Department (Issuance of No Trespass Order)
  - Vice President of Academic Affairs
  - Executive Director of Office of International Studies

# CGPS Graduate Programs Academic Misconduct Remediation

1. RSH 500 Graduate Research Preparation prepares learners for the academic rigor of graduate study including the foundational research skills necessary to promote academic integrity. This course is not initially required for graduate students in the College of Graduate and Professional Studies but is a resource designed to promote success.

2. Any student who receives a failing course grade due to academic misconduct is required to successfully complete RSH 500

as a condition of continued enrollment. Students can take RSH 500 in conjunction with other courses.

3. Any student who completes RSH 500 and commits academic misconduct in subsequent courses will be dismissed from the University without the ability to reapply.

# Academic Probation

Angola Campus

College of Graduate and Professional Studies

## Angola Campus

The academic performance of every student is monitored by the Registrar and the academic departments to determine satisfactory progress. Students with GPAs below 2.0 will receive a letter warning them that they have fallen below the standard required for graduation. (See chart below for further explanation of required GPA.)

Students are placed on probation in the following situations:

- Degree seeking students who have attempted 59 or fewer semester hours at Trine University and are more than six cumulative honor points below the 2.0 graduation standard. (See chart below for further explanation of required GPA.)
- Degree seeking students who have attempted 60 or more semester hours of coursework and have a cumulative grade point average lower than 2.0. Transfer hours are added to Trine University hours attempted for purposes of determining the 60 hours attempted.

A student on academic probation will have one semester to reach minimum standards or be dismissed. Students on probation who raise their cumulative GPA to acceptable academic standards will be removed from probationary status.

Students on probation who achieve at least a 2.0 GPA in summer courses will not be dismissed.

After a period of not less than one semester (not including summer semester), a dismissed student may apply for readmission to the program from which he or she was dismissed. A dismissed student may be readmitted without a waiting period in any other degree program to which the student can gain acceptance by the readmit committee.

Financial aid is not automatically reinstated when a dismissed student is readmitted.

Students on academic probation will have the following restrictions placed on their attendance:

- You are required to register for the University Academic Services support course.
- You may not register for more than 15 credit hours. If you wish to take more, you must petition the Readmit/Probation Committee for permission.
- You may not participate in the “rush” system for any fraternity or sorority.
- If you are an athlete, you are NOT eligible to participate in any competition.

For information concerning eligibility for the University’s extra-curricular activities, consult the Student Handbook.

The chart lists the grade point average (GPA) required to be removed from probation.

The required GPA is based on the number of GPA hours attempted at Trine University.

| GPA Hours Attempted | GPA | GPA Hours Attempted | GPA |
|---|---|---|---|
| 1 | 0.000 | 31 | 1.806 |
| 2 | 0.000 | 32 | 1.813 |
| 3 | 0.000 | 33 | 1.818 |
| 4 | 0.500 | 34 | 1.824 |
| 5 | 0.800 | 35 | 1.829 |
| 6 | 1.000 | 36 | 1.833 |
| 7 | 1.143 | 37 | 1.838 |
| 8 | 1.250 | 38 | 1.842 |
| 9 | 1.333 | 39 | 1.846 |
| 10 | 1.400 | 40 | 1.850 |
| 11 | 1.455 | 41 | 1.854 |
| 12 | 1.500 | 42 | 1.857 |
| 13 | 1.538 | 43 | 1.860 |
| 14 | 1.571 | 44 | 1.864 |
| 15 | 1.600 | 45 | 1.867 |
| 16 | 1.625 | 46 | 1.870 |
| 17 | 1.647 | 47 | 1.872 |
| 18 | 1.667 | 48 | 1.875 |
| 19 | 1.684 | 49 | 1.878 |
| 20 | 1.700 | 50 | 1.880 |
| 21 | 1.714 | 51 | 1.882 |
| 22 | 1.727 | 52 | 1.885 |
| 23 | 1.739 | 53 | 1.887 |
| 24 | 1.750 | 54 | 1.889 |
| 25 | 1.760 | 55 | 1.891 |
| 26 | 1.769 | 56 | 1.893 |
| 27 | 1.778 | 57 | 1.895 |
| 28 | 1.786 | 58 | 1.897 |
| 29 | 1.793 | 59 | 1.898 |
| 30 | 1.800 | 60 | 2.000 |

When a student has attempted a total of 60 credit hours, INCLUDING transfer credits, a 2.0 GPA is required to be in academic good standing.

# College of Graduate and Professional Studies

Graduate students in the Masters programs must maintain a 3.0. Students whose cumulative GPA drops below a 2.7 will be dismissed from Trine University. Students whose cumulative GPA falls between a 2.7 -2.99 will be given a probationary notice and asked to submit a self-assessment. This will only be permitted once and the student must then achieve a 3.0 by the end of the following semester. A student who is dismissed may apply for readmission immediately by contacting the Program Director and completing the re-admit form, providing a 3-4 paragraph written statement explaining why he/she was not meeting academic standards and outlining a plan for his/her future success. The re-admit form requires students to submit a plan for raising their cumulative GPA back to 3.00.

The Graduate Council will determine the outcome of the re-admit request.

Students whose cumulative GPA is below 3.0 and are on academic probation due to GPA, will not be eligible to participate in Curricular Practical Training (CPT) during the semester of probation. Students will regain eligibility once the academic probation has been lifted and they are in good academic standing of a 3.0 or higher.

# Administrative Dismissal Policy

***Disciplinary Dismissal***

A student may be dismissed from Trine University for disciplinary reasons. In such cases and regardless of the timing during a semester, the student is withdrawn from all classes, earns no credits for the semester, and is assigned a grade of "F" for each class. A disciplinary dismissal is final and cannot be erased by withdrawal from the university. Students wishing to return to the university must apply for readmission. Also, the judicial process is under the jurisdiction of the Dean of Students. The student forfeits all tuition and fees for the semester or term regardless of when the sanction is imposed. Financial Aid can be impacted if the student received any Title IV funding that requires enrollment for the entire semester.

***Excessive Absence Dismissal***

A student may be dismissed from Trine University for excessive absences from all classes. In such cases, the student has until the semester's withdrawal deadline to withdraw from all courses, which will garner a "W" on the transcript as the grade for each course. After the deadline to withdraw passes, the student will be administratively withdrawn from all courses, earn no credits for the semester, and be assigned a grade of "F" for each class. This excessive absence dismissal is final. Students wishing to return to the university must apply for readmission. The student forfeits all tuition and fees for the semester or term regardless of when the sanction is imposed. Financial Aid can be impacted if the student received any Title IV funding that requires enrollment for the entire semester. The judicial process is under the jurisdiction of the Dean of Students.

# Withdrawal from the University

**Voluntary**

A student wishing to withdraw from the University during a term may obtain a withdrawal form from the Office of Student Success and Retention. A student living in a residence hall should also consult the Office of Student Services.

**Planned Academic Leave**

For students not on academic probation who need some time away from campus and who do not wish to have their enrollment interrupted, Trine University has a Planned Academic Leave program (PAL). A student who plans to return to Trine University within one calendar year may apply for a Planned Academic Leave. This program provides the student with on-campus benefits during the period of the leave. Details and application forms are available in the Office of Student Success and Retention.

**Unauthorized**

A student leaving the University during a term without officially withdrawing will receive "F" grades in all courses and will not receive refunds of any kind, including fees and deposits.

The withdrawal procedure will not take place automatically for a student who leaves campus because of illness or family emergency. If official notification of withdrawal cannot be made in person, the student should contact the Registrar in writing.

**Disciplinary**

Students dismissed for disciplinary reasons during a term will be given "F" grades and monetary reimbursement will not be made for tuition, housing, or any other university fees.

**Administrative Withdrawal Policy**

Trine University may administratively withdraw a student from a particular course or courses for the following reasons:

***Academic Withdrawal***

The Registrar may administratively withdraw or drop a student from a course or courses for academic reasons such as the following: academic dismissal, unapproved credit overload, and not completing the necessary prerequisites for a particular course. An academic drop or withdrawal will be processed according to the established drop and withdrawal deadlines. A grade of "W" will be assigned in the case of a withdrawal. The student's GPA will not be affected.

***Medical Withdrawal***

As a result of medical necessity, a student may be withdrawn from a class or classes. Such requests are made through the Dean of Students in conjunction with the coordinator for health services. Such withdrawals will only be granted based on appropriate medical documentation. Once approved by the Dean of Students, the student is withdrawn from all applicable classes and is assigned a grade of "W." The student's grade point average is not affected. Where appropriate and with an instructor's permission, a student could receive a grade of "I" (Incomplete).

**International students must inform both their academic and international service advisor to withdraw.**

# Academic Grievance Procedure

Students are encouraged to voice concerns they have and should attempt, in the first instance, to resolve a concern by using a direct and informal approach. Concerns may be addressed with the support, involvement or intervention of university faculty and / or staff members. It is advisable to voice concerns as soon as possible and to seek informal resolution, if possible.

If, however, a student feels that a complaint has not been dealt with satisfactorily he/she should use the appropriate process to have the issue addressed and are encouraged to submit a Formal Complaint Form.

**Step One**: Complete a Notice of Complaint form found on the Trine University myPortal – Student Page, under Miscellaneous Student Forms - Formal Complaint Form. The student will need to provide the date of the incident and a thorough explanation of what happened. The student complaint must be submitted within 30 business days of the incident.

**Step Two:** The vice president for academic affairs (or designee) will review the complaint and forward the complaint to the appropriate University administrator who will be responsible for meeting with the concerned student and investigating the complaint. Action must be taken within 10 business days.

**Step Three**: After completing the investigation of the incident, the University administrator will render a decision in writing to all entities involved in the grievance process within 5 business days. That decision is considered final. A summary of the

findings will be submitted to the office of the VPAA for archiving purposes.

Students who are not satisfied with the results of the complaint process can contact the following entities:

Indiana Commission for Higher Education
101 W. Ohio Street, Suite 300
Indianapolis, IN 46204
Phone: 888.528.4719
Website: https://www.in.gov/che/student-complaints/

Higher Learning Commission
230 South LaSalle Street, Suite 7-500
Chicago, IL 60604
Phone: 800.621.7440
Website: https://www.hlcommission.org/Student-Resources/complaints.html

For students at the Arizona location: If the student complaint cannot be resolved after exhausting the Institution's grievance procedure, the student may file a complaint with the Arizona State Board for Private Post-Secondary Education. The student must Contact the State Board for further details.

The State Board address is:
1740 W. Adams Street, #3008
Phoenix, AZ 85007
Phone: 602/542-5709
Website: www.ppse.az.gov

For students at the Virginia location: If the student complaint cannot be resolved after exhausting the Institution's grievance procedure, the student may file a complaint with the State Council of Higher Education for Virginia (SCHEV). The student must Contact the State Board for further details by using this link: https://www.schev.edu/students/resources/student-complaints.

# Release of Student Information - FERPA

The Family Educational Rights and Privacy Act (FERPA) affords eligible students certain rights with respect to their education records. (An "eligible student" under FERPA is a student who is 18 years of age or older, or who attends a postsecondary institution at any age. At Trine, "attendance" begins on the first day of the term in which a student is enrolled.) These rights include:

1. **The right to inspect and review the student's education records within 45 days after the day the University receives a request for access.** A student should submit to the registrar, dean, head of the academic department, or other appropriate official, a written request that identifies the record(s) the student wishes to inspect. The University official will make arrangements for access and notify the student of the time and place where the records may be inspected. If the records are not maintained by the University official to whom the request was submitted, that official shall advise the student of the correct official to whom the request should be addressed.

2. **The right to request the amendment of the student's education records that the student believes are inaccurate, misleading, or otherwise in violation of the student's privacy rights under FERPA.** A student who wishes to ask the University to amend a record should write the University official responsible for the record, clearly identify the part of the record the student wants changed, and specify why it should be changed. The University will, within a reasonable time after receiving the request, decide whether to amend the record as requested. If the University decides not to amend the record as requested, the University will notify the student in writing of the decision and the student's right to a hearing regarding the request for amendment. Additional information regarding the hearing procedures will be provided to the student when notified of the right to a hearing.

3. **The right to provide written consent before the University discloses personally identifiable information (PII) from the student's education records, except to the extent that FERPA authorizes disclosure without consent.** In general, the University will not disclose PII from a student's education records to any third party without written consent. However, the University may, and from time to time does, disclose education records without a student's prior written consent under several FERPA exceptions. FERPA permits the disclosure of PII from students' education records, without consent of the student, if the disclosure meets certain conditions found in section 99.31 of the FERPA regulations. Except for disclosures to University officials, disclosures related to some judicial orders or lawfully issued subpoenas, disclosures of directory information, and disclosures to the student, section 99.32 of the FERPA regulations requires the University to record the disclosure. Eligible students have a right to inspect and review the record of disclosures. The University may disclose PII from the education records without obtaining prior written consent of the student —

   - To other **University officials,** including teachers, within the University whom the University has determined to have legitimate educational interests. A University official typically includes a person employed by the University in an administrative, supervisory, academic or research, or support staff position (including law enforcement unit personnel and health staff); a person serving on the Board of Trustees; or a student serving on an official committee, such as a disciplinary or grievance committee. A University official also may include a volunteer or contractor outside the University who performs an institutional service or function for which the University would otherwise use its own employees and who is under the direct control of the University with respect to the use and maintenance of PII from education records, such as an attorney, auditor, or collection agent or a student volunteering to assist another University official in performing his or her tasks. A University official has a **legitimate educational interest** if the official needs to review an education record in order to fulfill his or her professional responsibilities for the University. (§ 99.31(a)(1))

   - To officials of another school where the student seeks or intends to enroll, or where the student is already enrolled if the disclosure is for purposes related to the student's enrollment or transfer, subject to the requirements of section 99.34. (§ 99.31(a)(2))

   - To authorized representatives of the U. S. Comptroller General, the U.S. Attorney General, the U.S. Secretary of Education, or State and local educational authorities, such as a State postsecondary authority that is responsible for supervising the university's State-supported education programs. Disclosures under this provision may be made, subject to the requirements of section 99.35, in connection with an audit or evaluation of Federal- or State-supported education programs, or for the enforcement of or compliance with Federal legal requirements that relate to those programs. These entities may make further disclosures of PII to outside entities that are designated by them as their authorized representatives to conduct any audit, evaluation, or enforcement or compliance activity on their behalf. (§§ 99.31(a)(3) and 99.35)

   - In connection with financial aid for which the student has applied or which the student has received, if the information is necessary to determine eligibility for the aid, determine the amount of the aid, determine the conditions of the aid, or enforce the terms and conditions of the aid. (§ 99.31(a)(4))

   - To organizations conducting studies for, or on behalf of, the University, in order to: (a) develop, validate, or administer predictive tests; (b) administer student aid programs; or (c) improve instruction. (§ 99.31(a)(6))

   - To accrediting organizations to carry out their accrediting functions. (§ 99.31(a)(7))

   - To parents of an eligible student if the student is a dependent for IRS tax purposes. (§ 99.31(a)(8))

   - To comply with a judicial order or lawfully issued subpoena. (§ 99.31(a)(9))

   - To appropriate officials in connection with a health or safety emergency, subject to § 99.36. (§ 99.31(a)(10))

   - Information the University has designated as "directory information" under § 99.37. (§ 99.31(a)(11))

   - To a victim of an alleged perpetrator of a crime of violence or a non-forcible sex offense, subject to the requirements of § 99.39. The disclosure may only include the final results of the disciplinary proceeding with respect to that alleged crime or offense, regardless of the finding. (§ 99.31(a)(13))

- To the general public, the final results of a disciplinary proceeding, subject to the requirements of § 99.39, if the University determines the student is an alleged perpetrator of a crime of violence or non-forcible sex offense and the student has committed a violation of the University's rules or policies with respect to the allegation made against him or her. (§ 99.31(a)(14))

- To parents of a student regarding the student's violation of any Federal, State, or local law, or of any rule or policy of the University, governing the use or possession of alcohol or a controlled substance if the University determines the student committed a disciplinary violation and the student is under the age of 21. (§99.31(a)(15))

4. **The right to file a complaint with the U.S. Department of Education concerning alleged failures by the University to comply with the requirements of FERPA.**

The name and address of the Office that administers FERPA is:
Family Policy Compliance Office
U.S. Department of Education
400 Maryland Avenue, SW
Washington, DC 20202

**Directory Information**

FERPA designates certain information related to a student as **"Directory Information."** FERPA gives the University the right to disclose such information to anyone inquiring without having to ask a student for permission, unless the student specifically requests in writing that all such information not be made public without written consent. Trine University has designated the following as "Directory Information": Name, local address and telephone number, permanent address, e-mail address, date and place of birth, photograph or likeness, college, curriculum, enrollment status (full/part-time), classification, dates of attendance at Trine University, awards and academic honors, degrees and dates awarded, most recent previous educational institution attended, participation in officially recognized activities and athletic teams, and height and weight of student athletes.

While attending Trine University, students may request to restrict the release of their Directory Information except to University officials with a legitimate educational interest, as outlined in section three above. In order to restrict all information, a signed and dated written request must be made in writing to the Office of the Registrar. Students may notify the University at any time that he or she does not want any or all of the above types of information designated as Directory Information, but the notice will not be applied retroactively by the University.

# Arts and Sciences

**Trine University's Jannen School of Arts & Sciences includes:**

DEPARTMENT OF CRIMINAL JUSTICE

- ASSOCIATE IN CRIMINAL JUSTICE
- ASSOCIATE IN GENERAL STUDIES
- BACHELOR OF SCIENCE WITH MAJOR IN CRIMINAL JUSTICE
- BACHELOR OF ARTS WITH MAJOR IN GENERAL STUDIES

DEPARTMENT OF HUMANITIES AND COMMUNICATION

- ASSOCIATE IN ARTS
- BACHELOR OF ARTS WITH MAJOR IN COMMUNICATION
- BACHELOR OF ARTS WITH MAJOR IN ENGLISH

DEPARTMENT OF MATHEMATICS

- ASSOCIATE IN SCIENCE WITH AN EMPHASIS IN MATHEMATICS
- BACHELOR OF SCIENCE WITH MAJOR IN ACTUARIAL SCIENCE
- BACHELOR OF SCIENCE WITH MAJOR IN MATHEMATICS

DEPARTMENT OF PSYCHOLOGY AND SOCIAL SCIENCES

- BACHELOR OF SCIENCE WITH MAJOR IN PSYCHOLOGY

DEPARTMENT OF MUSIC

DEPARTMENT OF PHYSICS

MATHEMATICS HELP SESSIONS

WRITING CENTER

**The School**

The Jannen School of Arts and Sciences was named in honor of Robert L. Jannen, a 1950 chemical engineering graduate and former member of the University's Board of Trustees, and his wife Dolores. The Jannen School prepares students in communication, criminal justice, English, psychology, and mathematics for careers in their chosen fields. The professional focus of its degree programs ensures graduates are ready for the workplace; the School's commitment to a liberal arts education prepares these same graduates to succeed, lead, and serve in a rapidly changing global economy in which the ability to solve problems creatively, think critically, and communicate effectively are often more highly valued than a technical education alone. The School also serves the entire student body by teaching the majority of the general education courses required for all programs.

# Department of Criminal Justice

## Associate in Criminal Justice (60 hrs.)

A career in criminal justice is both exciting and rewarding. The well-rounded Associate in Criminal Justice (60 Credit Hours) degree program prepares you for a career in the justice system. Graduates who earn Trine University's Associate in Criminal Justice degree receive an academic base for a career in the criminal justice field. This degree also prepares you for more advanced education opportunities such as the Bachelor of Science in Criminal Justice.

**Mission**

The Department of Criminal Justice's mission is to provide career-oriented higher education and to deliver quality teaching to students seeking to complete the Trine University General Education requirements as well as to meet the social sciences, humanistic, global and American perspectives required by the Common Ground component in General Education.

**Degree Requirements**

General Education Requirements - 21 hours

Communication – 6 hrs.

| | | |
|---|---|---|
| ENG 143 | College Composition | 3 |
| HUM 203 | Humanities Seminar | 3 |

Humanities and Social Science – 6 hrs.

| | | |
|---|---|---|
| SOC 103 | Principles of Sociology | 3 |
| | Humanities | 3 |

Mathematics and Science – 6 hrs.

| | | |
|---|---|---|
| | Mathematics Elective (3) | 3 |
| | Science Elective (3) | 3 |

Other General Education – 3 hrs.

| | | |
|---|---|---|
| POLS 113 | Introduction to Government | 3 |

Additional Requirements - 15 hours

Required

| | | |
|---|---|---|
| UE 101 | University Experience | 1 |
| | Or | |
| UE 111 | Online Learning Orientation | 1 |
| | Electives (14) | 14 |

Content Requirements - 24 hours

Required

| | | |
|---|---|---|
| CRJ 103 | Introduction to Criminal Justice | 3 |
| CRJ 133 | Criminal Justice Report Writing | 3 |
| CRJ 153 | Juvenile Justice | 3 |
| CRJ 263 | Introduction to Criminal Law & Justice | 3 |
| CRJ 273 | Criminal Procedure & Evidence | 3 |
| CRJ 343 | Criminalistics & Crime Scene Investigations | 3 |
| PSY 113 | Principles of Psychology | 3 |
| PSY 383 | Forensic Psychology | 3 |

# Associate in General Studies (60 hrs.)

**Degree Requirements**

General Education Requirements - 22 hours

Communication – 6 hrs.

| | | |
|---|---|---|
| ENG 143 | College Composition | 3 |
| HUM 203 | Humanities Seminar | 3 |

Humanities and Social Science – 6 hrs.

| | | |
|---|---|---|
| | Social Science Elective (3) | 3 |
| | Humanities Elective (3) | 3 |

Mathematics and Science – 6 hrs.

| | | |
|---|---|---|
| | Mathematics Elective (3) | 3 |
| | Science Elective (3) | 3 |

Other – 4 hrs.

| | | |
|---|---|---|
| | General Education Electives (4) | 4 |

Additional Requirements - 1 hour

Required

| | | |
|---|---|---|
| UE 101 | University Experience | 1 |
| | Or | |
| UE 111 | Online Learning Orientation | 1 |

Content Requirements - 37 hours

37 credit hours, to include at least 9 hours earned from two different academic departments

# Bachelor of Science – Criminal Justice Major (120 hrs.)

The Bachelor of Science with a major in criminal justice program is designed to prepare learners with the skills needed to be leaders in the criminal justice field. Throughout this program, learners will examine the various aspects that makeup the criminal justice system and will gain the knowledge needed to enter any criminal justice field. Learners will also develop the professional, ethical, communication, and critical thinking skills needed to be leaders within the criminal justice industry. This program also prepares learners to further their education and continue onto graduate school.

**Mission**

The mission of the Bachelor of Science with a major in criminal justice program is to prepare criminal justice professionals to enter any criminal justice field with high ethical and moral standards while exhibiting professional behavior and the knowledge needed to be leaders in their careers.

**Outcomes**

Examine components that make up the criminal justice system including law enforcement, courts, and corrections.
Assess the impact the three levels of government have on the criminal justice system.
Apply the professional and ethical conduct needed to be an effective criminal justice professional.
Develop the communication and critical thinking skills required for a criminal justice career.
Identify strengths, weaknesses, opportunities, and threats within the criminal justice system.

**Degree Requirements**

General Education Requirements - 36 hours

Communication – 9 hrs.

| | | |
|---|---|---|
| ENG 143 | College Composition | 3 |
| HUM 203 | Humanities Seminar | 3 |
| SP 203 | Effective Speaking | 3 |
| | Or | |
| COM 163 | Interpersonal Communication | 3 |

Humanities and Social Science – 9 hrs.

| | | |
|---|---|---|
| HIS 103 | American History I | 3 |
| HIS 113 | American History II | 3 |
| | Or | |
| HIS 203 | World Civilization I | 3 |
| HIS 213 | World Civilization II | 3 |
| | Humanities Elective (3) | 3 |

Mathematics and Science – 9 hrs.

| | | |
|---|---|---|
| BIO 1003 | Plants and People (no lab) | 3 |
| | Mathematics Elective (3) | 3 |
| | Math or Science Elective (3) | 3 |

Other – 9 hrs.

| | | |
|---|---|---|
| SOC 103 | Principles of Sociology | 3 |
| POLS 113 | Introduction to Government | 3 |
| PSY 113 | Principles of Psychology | 3 |

Content Requirements - 69 hours

Required

| | | |
|---|---|---|
| UE 101 | University Experience | 1 |
| | Or | |
| UE 111 | Online Learning Orientation | 1 |
| CRJ 103 | Introduction to Criminal Justice | 3 |
| CRJ 133 | Criminal Justice Report Writing | 3 |
| CRJ 153 | Juvenile Justice | 3 |
| CRJ 243 | Introduction to Criminology | 3 |
| CRJ 263 | Introduction to Criminal Law & Justice | 3 |
| CRJ 273 | Criminal Procedure & Evidence | 3 |
| CRJ 343 | Criminalistics & Crime Scene Investigations | 3 |
| POLS 333 | State & Local Government | 3 |

| | | |
|---|---|---|
| POLS 403 | American Constitutional Development | 3 |
| PSY 323 | Abnormal Psychology | 3 |

Capstone and Internship – 6 hrs.

| | | |
|---|---|---|
| CRJ 433 | Criminal Justice Capstone Demonstration | 3 |
| CRJ 473 | Criminal Justice Internship | 3 |

Free Electives – 32 hrs.

Electives are determined in conjunction with an advisor and based on student career objectives.

Concentrations - 15 hours

Select one of the following three concentrations.

Option A – Criminal Justice Professional – 15 hrs.

| | | |
|---|---|---|
| CRJ 363 | Institutional Corrections & Law | 3 |
| PSY 303 | Research Methods in Psychology | 3 |
| CRJ 423 | Criminal Justice Agency Administration | 3 |
| CRJ 453 | Topics in Criminal Justice | 3 |
| SOC 323 | The Family | 3 |

Option B – Psychology – 15 hrs.

| | | |
|---|---|---|
| PSY 223 | Life Span Developmental Psychology | 3 |
| | Or | |
| PSY 353 | Child & Adolescent Psychology | 3 |
| | | |
| PSY 303 | Research Methods in Psychology | 3 |
| PSY 333 | Psychology of Personality | 3 |
| PSY 343 | Social Psychology | 3 |
| PSY 423 | Counseling Theories & Practices | 3 |

Option C – Indiana Law Enforcement – 15 hrs.

Successful completion of Indiana Law Enforcement Academy Basic Police Training Course.

| | | |
|---|---|---|
| CRJ 4015 | Basic Police Training Course | 15 |

# Bachelor of Arts - General Studies Major (120 hrs.)

**Program Mission:**

The General Studies program prepares students for post-graduate success by allowing them to structure an individualized academic experience in close consultation with an advisor.

**Program Outcomes:**

Students will demonstrate proficiency in at least two separate academic areas.

Students will synthesize their two or three focus areas of study into a final project that demonstrates career readiness.

Students will articulate a plan for post-graduate success.

**Degree Requirements**

General Education Requirements - 33 hours

Communication – 9 hrs.

| | | |
|---|---|---|
| ENG 143 | College Composition | 3 |
| | Or | |
| ENG 133 | Technical Communication | 3 |
| HUM 203 | Humanities Seminar | 3 |
| SP 203 | Effective Speaking | 3 |

Humanities and Social Science – 9 hrs.

| | | |
|---|---|---|
| | Humanities Elective (3) | 3 |
| | Social Science Elective (3) | 3 |
| | Humanities or Social Science Elective | 3 |

Mathematics and Science – 9 hrs.

| | | |
|---|---|---|
| | Mathematics Elective (3) | 3 |
| | Science Elective (3) | 3 |
| | Math or Science Elective (3) | 3 |

Other – 6 hrs.

| | | |
|---|---|---|
| | General Education Electives (6) | 6 |

Focus Areas -- 56 hours

Students can choose two or three focus areas. A focus area consists of at least eighteen credit hours of coursework taken from a single field (i.e. courses with the same catalog prefix). Each focus area must include a minimum of six hours of coursework at the 300 level or above. Students must take a minimum of 21 credit hours at the 300 level or above.

Additional Required Coursework -- 4 hours

| | | |
|---|---|---|
| UE 101 | University Experience | 1 |
| | Or | |
| UE 111 | Online Learning Orientation | 1 |
| GS 4003 | Senior Capstone Project | 3 |

Free Electives – 27 hrs.

Electives are determined in conjunction with an advisor and based on student career objectives.

# Department of Humanities and Communication

## Associate in Arts (60 hrs.)

**Mission**

The Department of Humanities and Communication promotes the intellectual and personal development of all students through a platform of humanistic experiences and application of concentrated practical communication skills while preparing majors to lead, succeed, and serve in their careers and lives.

**Outcomes**

Students will be able to:

1. *Reading*: Demonstrate skill in close, critical reading of a variety of texts and genres
2. *Writing*: Possess skill in writing a variety of texts for multiple audiences and purposes
3. *Researching*: Apply appropriate research processes, tools, and methods to demonstrate critical understanding
4. *Applying*: Apply the skills of reading, writing, and researching to multiple professional and academic contexts
5. *Engaging*: Engage with texts and experiences from multiple cultures and diverse perspectives

**Degree Requirements**

General Education Requirements - 22 hours

Communication – 6 hrs.

| | | |
|---|---|---|
| ENG 133 | Technical Communication | 3 |
| HUM 203 | Humanities Seminar | 3 |

Humanities and Social Science – 6 hrs.

| | | |
|---|---|---|
| | Social Science Elective (3) | 3 |
| | Humanities | 3 |

Mathematics and Science - 7 hrs.

| | | |
|---|---|---|
| | Mathematics Elective (3) | 3 |
| | Lab Science Elective (4) | 4 |

Other – 3 hrs.

| | | |
|---|---|---|
| | General Education Electives (3) | 3 |

Additional Requirements - 14 hours

Required

| | | |
|---|---|---|
| UE 101 | University Experience | 1 |
| SP 203 | Effective Speaking | 3 |
| | Free Electives (10) | 10 |

Content Requirements - 24 hours

Required

Complete 24 hours in one of the following areas:

| | |
|---|---|
| COM | Communication |
| ENG | English |
| HIS | History |
| | Humanities |
| MUS | Music |

*Humanities: See Humanities list*

# Bachelor of Arts—Communication Major (120 hrs.)

A degree in Communication provides students with applied knowledge concerning practical approaches to communication while promoting academic creativity and work-place applicable skills.

The Department of Humanities and Communication promotes the intellectual and personal development of all students through a platform of humanistic experiences and application of concentrated practical communication skills while preparing majors to lead, succeed, and serve in their careers and lives.

**Mission**

The Department of Humanities and Communication promotes the intellectual and personal development of all students through a platform of humanistic experiences and application of concentrated practical communication skills while preparing majors to lead, succeed, and serve in their careers and lives.

**Outcomes**

1. *Engaging*: Develop the skills and cultural competencies to interact substantively with diverse texts, perspectives, individuals, and communities.

2. *Evaluating*: Analyze media and culture using appropriate research processes, tools, and methods.

3. *Creating*: Apply key messaging techniques creatively, effectively, and responsibly across audiences, contexts, and channels.

**Degree Requirements**

General Education Requirements - 30 hours

Communication – 9 hrs.

| | | |
|---|---|---|
| ENG 143 | College Composition | 3 |
| HUM 203 | Humanities Seminar | 3 |
| SP 203 | Effective Speaking | 3 |

Humanities and Social Science – 9 hrs.

| | | |
|---|---|---|
| PSY 113 | Principles of Psychology | 3 |
| PSY 3023 | Cross-Cultural Psychology | 3 |
| | Humanities Elective (3) | 3 |

Mathematics and Science – 9 hrs.

| | | |
|---|---|---|
| | Mathematics Elective (3) | 3 |
| | Science Elective (3) | 3 |
| | Math or Science Elective (3) | 3 |

Other –3 hrs.

| | | |
|---|---|---|
| COM 123 | History of the Media | 3 |

Content Requirements - 90 hours

Required - 58 hrs

| | | |
|---|---|---|
| UE 101 | University Experience | 1 |
| COM 102 | Professional Practice I | 2 |
| COM 111 | Practices & Professions | 1 |
| COM 153 | Principles of Public Relations | 3 |
| COM 163 | Interpersonal Communication | 3 |
| COM 183 | Writing For The Media | 3 |
| COM 202 | Professional Practice II | 2 |
| COM 203 | Media & Society | 3 |
| COM 233 | Intercultural Communication | 3 |

| | | |
|---|---|---|
| COM 243 | Digital Media Creation | 3 |
| COM 253 | Event Planning & Promotion | 3 |
| COM 263 | Communication Research | 3 |
| COM 273 | Video Production | 3 |
| COM 302 | Professional Practice III | 2 |
| COM 303 | Digital Photography | 3 |
| COM 363 | Rhetoric and Persuasion | 3 |
| COM 373 | Topics In Communication | 3 |
| COM 383 | Advanced Writing for the Media | 3 |
| COM 402 | Professional Practice IV | 2 |
| COM 433 | Media Law & Ethics | 3 |
| COM 453 | Public Relations Planning & Campaigns | 3 |
| MUS 363 | Recording Techniques and Sound Reinforcement | 3 |

Capstone and Internship – 3 hrs.

| | | |
|---|---|---|
| COM 4013 | Senior Capstone Internship in Communication | 3 |
| | Or | |
| COM 4281 | Senior Communication Project Proposal | 1 |
| | And | |
| COM 4292 | Senior Communication Project | 2 |

Free Electives – 14 hrs.

Electives are determined in conjunction with an advisor and based upon student interest.

Career Focused Electives- 15 hrs.

Advisor will assist student to select 15 hours of career-focused electives from the following prefixes:

COM, CSIT, DEI, ENG, HR, HUM, LDR, MGT, MK, POLS, SI, SOC

# Bachelor of Arts—English Major (120 hrs.)

**Mission**

The Department of Humanities and Communication promotes the intellectual and personal development of all students through a platform of humanistic experiences and application of concentrated practical communication skills while preparing majors to lead, succeed, and serve in their careers and lives.

**Outcomes**

Students will be able to:

1. *Reading*: Demonstrate skill in close, critical reading of a variety of texts and genres
2. *Writing*: Possess skill in writing a variety of texts for multiple audiences and purposes
3. *Researching*: Apply appropriate research processes, tools, and methods to demonstrate critical understanding
4. *Applying*: Apply the skills of reading, writing, and researching to multiple professional and academic contexts
5. *Engaging*: Engage with texts and experiences from multiple cultures and diverse perspectives

**Degree Requirements**

General Education Requirements - 30 hours

Communication – 9 hrs.

| | | |
|---|---|---|
| ENG 143 | College Composition | 3 |
| HUM 203 | Humanities Seminar | 3 |
| SP 203 | Effective Speaking | 3 |

Humanities and Social Science – 9 hrs.

| | | |
|---|---|---|
| COM 233 | Intercultural Communication | 3 |
| PSY 113 | Principles of Psychology | 3 |
| HIS | Elective | 3 |

Mathematics and Science – 9 hrs.

| | | |
|---|---|---|
| | Mathematics Elective (3) | 3 |
| | Science Elective (3) | 3 |
| | Math or Science Elective (3) | 3 |

Other – 3 hrs.

| | | |
|---|---|---|
| | Social Science Elective (3) | 3 |

Content Requirements - 90 hours

Required

| | | |
|---|---|---|
| UE 101 | University Experience | 1 |

Free Electives – 29 hrs.

Electives are determined in conjunction with an advisor and based on student career objectives.

Composition Core – 15 hrs.

| | | |
|---|---|---|
| COM 183 | Writing For The Media | 3 |
| COM 383 | Advanced Writing for the Media | 3 |
| ENG 133 | Technical Communication | 3 |
| ENG 273 | Creative Writing | 3 |
| ENG 453 | Advanced Composition | 3 |

Literature Core – 24 hrs.

| | | |
|---|---|---|
| ENG 153 | Introduction to Literature | 3 |
| ENG 433 | Shakespeare & His Times | 3 |
| | Literature Electives | 12 |

Complete 2 Survey Courses – 6 hrs.

| | | |
|---|---|---|
| ENG 2013 | British Literature I | 3 |
| ENG 2023 | British Literature II | 3 |
| ENG 2113 | American Literature I | 3 |
| ENG 2123 | American Literature II | 3 |
| ENG 253 | World Literature | 3 |

Professional Practice Core – 21 hrs.

| | | |
|---|---|---|
| COM 111 | Practices & Professions | 1 |
| COM 301 | Media Practicum | 1 |
| COM 243 | Digital Media Creation | 3 |
| COM 343 | Web Content Management | 3 |
| ENG 363 | The English Language | 3 |

| | | |
|---|---|---|
| ENG 411 | Writing Center Consulting Laboratory | 1 |
| ENG 412 | Writing Center Consulting | 2 |
| ENG XX3 | Literature through the Professional Lens | 3 |
| ENG 4023 | Senior Capstone Internship | 3 |

*COM 301: taken twice*

*ENG XX3: PENDING*

# Department of Mathematics

## Associate in Science with an Emphasis in Mathematics (60 hrs.)

**Degree Requirements**

General Education Requirements - 22 hours

Communication – 6 hrs.

| | | |
|---|---|---|
| ENG 133 | Technical Communication | 3 |
| | Or | |
| ENG 143 | College Composition | 3 |
| HUM 203 | Humanities Seminar | 3 |

Humanities and Social Science – 6 hrs.

| | | |
|---|---|---|
| | Social Science Elective (3) | 3 |
| | Humanities Elective (3) | 3 |

Mathematics and Science – 7 hrs.

| | | |
|---|---|---|
| | Mathematics Elective (3) | 3 |
| | Lab Science Elective (4) | 4 |

Other – 3 hrs.

| | | |
|---|---|---|
| | General Education Electives (3) | 3 |

Additional Requirements - 18 hours

Required

| | | |
|---|---|---|
| UE 101 | University Experience | 1 |
| | Electives (17) | 17 |

Content Requirements - 20 hours

Mathematics courses

*Student must complete 20 total hours in mathematics*

## Bachelor of Science – Actuarial Science Major (120 hrs.)

The Bachelor of Science with a major in Actuarial Science program at Trine University prepares students for a career as an actuary. Graduates will have the knowledge and skills to pass the preliminary exams P (Probability) and FM (Financial Mathematics) as given by the Society of Actuaries, as well as the foundation needed to prepare to pass the remaining exams offered by the society. Courses in the Bachelor of Science with a major in Actuarial Science program include the broad range of mathematics, probability and finance needed for success in the actuarial profession. Students will learn to solve problems in a non-deterministic setting using appropriate statistical and probabilistic methods, and to solve problems in a deterministic

setting in finance and investments. They also will apply probabilistic and statistical tools and methods to areas such as finance, investments, insurance and risk analysis. Graduates who eventually pass actuarial exams can be employed by the government or by any business that needs to manage financial risk, including insurance companies, consulting firms, large corporations, hospitals, banks and investment firms.

**Degree Requirements**

General Education Requirements - 33 hours

Communication – 9 hrs.

| | | |
|---|---|---|
| ENG 133 | Technical Communication | 3 |
| | Or | |
| ENG 143 | College Composition | 3 |
| HUM 203 | Humanities Seminar | 3 |
| SP 203 | Effective Speaking | 3 |
| | Or | |
| COM 163 | Interpersonal Communication | 3 |

Humanities and Social Science – 9 hrs.

| | | |
|---|---|---|
| ECO 213 | Microeconomics | 3 |
| ECO 223 | Macroeconomics | 3 |
| PHL 343 | Logic | 3 |

Mathematics and Science – 12 hrs.

| | | |
|---|---|---|
| MA 134 | Calculus I | 4 |
| PH 224 | University Physics I | 4 |
| PH 234 | University Physics II | 4 |
| | Or | |
| CH 104 | General Chemistry I | 4 |
| CH 114 | General Chemistry II | 4 |
| | Or | |
| BIO 114 | Principles of Biology I | 4 |
| BIO 124 | Principles of Biology II | 4 |

Other – 3 hrs.

| | | |
|---|---|---|
| CSIT 163 | Using Programming to Solve Problems | 3 |
| | Or | |
| CS 1113 | Introduction to Object-Oriented Program | 3 |

Content Requirements - 87 hours

Required

| | | |
|---|---|---|
| UE 101 | University Experience | 1 |

Content – 49 hrs.

*A grade of "C" or higher is required for each content course in the major.*

| | | |
|---|---|---|
| MA 164 | Calculus II | 4 |

| | | |
|---|---|---|
| MA 213 | Calculus III | 3 |
| MA 233 | Differential Equations | 3 |
| MA 313 | Introduction to Linear Algebra | 3 |
| MA 343 | Introduction to Proofs | 3 |
| MA 3093 | Probability | 3 |
| MA 393 | Probability & Statistics | 3 |
| MA 3193 | Financial Mathematics | 3 |
| MA 3293 | Advanced Probability & Statistics | 3 |
| MA 403 | Real Analysis | 3 |
| MA 4093 | Actuarial Modeling | 3 |

| | | |
|---|---|---|
| AC 203 | Accounting I | 3 |
| AC 213 | Accounting II | 3 |
| BA 213 | Business Spreadsheets | 3 |
| FIN 303 | Managerial Finance | 3 |
| FIN 403 | Investments | 3 |

Free Electives – 37 hrs.

Electives are determined in conjunction with an advisor and based on student career objectives.

| | | |
|---|---|---|
| | General Electives (37) | 37 |

**Outcomes**

Apply mathematical and statistical skills to course-specific settings and problems requiring knowledge from multiple fields of mathematics and actuarial science.
Identify and propose solutions to real world problems involving risk and uncertainty.
Complete the requirements for all Validation by Educational Experience as laid out by the Society Of Actuaries in order to gain an understanding of economics, finance, accounting, and statistics.
Apply key concepts and foundational skills as associated with the preliminary exams P (Probability) and FM (Financial Mathematics) as given by the Society Of Actuaries (SOA) and to gain the foundations to study for future exams offered by the SOA.

## Bachelor of Science – Mathematics Major (120 hrs.)

The mathematics curriculum is a broad-based program with special emphasis on developing critical reasoning skills and fostering competence in mathematical analysis, application, and expression. A BS degree in mathematics can lead to some of the most rewarding and satisfying careers, such as operations research analysts, mathematicians, statisticians, actuaries, data scientists, financial analysts, postsecondary teachers, cryptographers, and risk analyst, just to name a few. Moreover, several government agencies including NSA, NASA, FBI, CIA, private banks, insurance agencies, software developers, and other STEM research organizations offer attractive career paths to math majors. Students in our program can further strengthen their academic and professional portfolio by choosing an appropriate academic minor, and/or a dual degree/major program. Being an institutional member of the Mathematical Association of America (MAA), we are able to offer complimentary MAA membership to our students, so that they can enjoy being in the largest national network of mathematicians. We sponsor our students to attend, and present at regional math meetings, and also offer independent study, and undergraduate research experience on as needed basis. Our academic and career advisors gladly help our students in setting and earning their goals, and our faculty takes great pride in preparing our students to succeed, lead, and serve.

**Mission**

To develop students' capability to ask and answer well posed questions in myriad disciplines using tools from across the mathematical spectrum in order to prepare students for success in those disciplines.

**Outcomes**

To apply mathematical skills to course-specific settings and problems requiring knowledge from multiple fields of mathematics.
To write proofs of mathematical statements with full rigor and to learn to find counterexamples to false statements.
To correctly and succinctly interpret mathematical objects and notions along with their underlying intuitive meanings.
To properly construct and format written mathematics for the purposes of giving talks and seminars.
To prepare for post-graduation success by securing a position in the work-force or building a strong application portfolio for admission to graduate school.

**Degree Requirements**

General Education Requirements 33 hours

Communication – 9 hrs.

| | | |
|---|---|---|
| ENG 133 | Technical Communication | 3 |
| | Or | |
| ENG 143 | College Composition | 3 |
| HUM 203 | Humanities Seminar | 3 |
| SP 203 | Effective Speaking | 3 |
| | Or | |
| COM 163 | Interpersonal Communication | 3 |

Humanities and Social Science – 9 hrs.

| | | |
|---|---|---|
| PHL 343 | Logic | 3 |
| | Social Science Elective (3) | 3 |
| | Humanities or Social Science Elective | 3 |

Mathematics and Science – 12 hrs.

| | | |
|---|---|---|
| MA 134 | Calculus I | 4 |
| PH 224 | University Physics I | 4 |
| PH 234 | University Physics II | 4 |
| | Or | |
| CH 104 | General Chemistry I | 4 |
| CH 114 | General Chemistry II | 4 |
| | Or | |
| BIO 114 | Principles of Biology I | 4 |
| BIO 124 | Principles of Biology II | 4 |

Other – 3 hrs.

| | | |
|---|---|---|
| CS 1113 | Introduction to Object-Oriented Program | 3 |
| | Or | |
| CSIT 163 | Using Programming to Solve Problems | 3 |

Content Requirements 87 hours

Required - 1 hr.

| | | |
|---|---|---|
| UE 101 | University Experience | 1 |

Content – 37 hrs.

*A grade of "C" or higher is required for each mathematics course in the major.*

| | | |
|---|---|---|
| MA 143 | Discrete Mathematics | 3 |

| | | |
|---|---|---|
| MA 164 | Calculus II | 4 |
| MA 213 | Calculus III | 3 |
| MA 233 | Differential Equations | 3 |
| MA 313 | Introduction to Linear Algebra | 3 |
| MA 343 | Introduction to Proofs | 3 |
| MA 453 | Point-Set Topology | 3 |
| MA 4013 | Abstract Algebra | 3 |
| MA 403 | Real Analysis | 3 |
| MA 423 | Complex Variables | 3 |
| MA 473 | Graph Theory & Combinatorics | 3 |
| MA 483 | Mathematics Capstone I | 3 |

Choose 9 credits from

| | | |
|---|---|---|
| MA 333 | Number Theory | 3 |
| MA 353 | Vector Analysis | 3 |
| MA 363 | Advanced Differential Equations | 3 |
| MA 3093 | Probability | 3 |
| MA 393 | Probability & Statistics | 3 |
| MA 3003 | Topics in Mathematics | 3 |
| MA 3193 | Financial Mathematics | 3 |
| MA 3293 | Advanced Probability & Statistics | 3 |
| MA 413 | Advanced Linear Algebra | 3 |
| MA 4003 | Special Problems in Mathematics | 3 |

Electives – 40 hrs.

General Electives

# Department of Psychology and Social Sciences

## Bachelor of Science – Psychology Major (120 hrs.)

**Mission**

The Department of Psychology will provide students with competency in psychology, including requisite skills in analyzing human behavior, a broad range of research and skills relating to psychology, an understanding and be able to apply psychological concepts and principles, knowledge of the ethical questions and issues in psychology, and a broad understanding of all major areas of psychology. The Department offers programs leading to careers in mental health and social sciences education, as well as a preparation for further professional training in law, public administration, psychology, history, and social service.

**Degree Requirements**

General Education Requirements - 36 hours

Communication – 9 hrs.

| | | |
|---|---|---|
| ENG 143 | College Composition | 3 |
| HUM 203 | Humanities Seminar | 3 |
| SP 203 | Effective Speaking | 3 |
| | Or | |

| | | |
|---|---|---|
| COM 163 | Interpersonal Communication | 3 |

Humanities and Social Science – 12 hrs.

| | | |
|---|---|---|
| PSY 113 | Principles of Psychology | 3 |
| POLS 113 | Introduction to Government | 3 |
| SOC 103 | Principles of Sociology | 3 |
| | Humanities Elective (3) | 3 |

Mathematics and Science – 9 hrs.

| | | |
|---|---|---|
| | Mathematics Elective (3) | 3 |
| | Biology Elective (3) | 3 |
| | Math or Science Elective (3) | 3 |

Other – 6 hrs.

| | | |
|---|---|---|
| HIS 103 | American History I | 3 |
| | And | |
| HIS 113 | American History II | 3 |
| | Or | |
| HIS 203 | World Civilization I | 3 |
| | And | |
| HIS 213 | World Civilization II | 3 |

Content Requirements - 84 hours

Required

| | | |
|---|---|---|
| UE 101 | University Experience | 1 |
| | Or | |
| UE 111 | Online Learning Orientation | 1 |

Electives – 35 hrs.

Students wishing to pursue graduate training in psychology should also take MA 113 College Algebra and MA 253 Statistics.

| | | |
|---|---|---|
| | Electives (35) | 35 |

Required Core – 6 hrs.

| | | |
|---|---|---|
| PSY 303 | Research Methods in Psychology | 3 |
| PSY 453 | Clinical Internship I | 3 |
| | Or | |
| PSY 473 | Psychology Capstone Demonstration | 3 |

Subject Area Concentrations - 24 hrs.

Choose four of the following clinical core courses – 12 hrs.

| | | |
|---|---|---|
| PSY 323 | Abnormal Psychology | 3 |
| PSY 363/SOC 363 | Human Behavior & Counseling | 3 |
| PSY 403 | Human Sexuality | 3 |
| PSY 413 | The Psychology of Addiction | 3 |
| PSY 423 | Counseling Theories & Practices | 3 |

Choose two of the following social/cognitive core courses – 6 hrs.

| | | |
|---|---|---|
| PSY 333 | Psychology of Personality | 3 |

| | | |
|---|---|---|
| PSY 343 | Social Psychology | 3 |
| PSY 373 | Political Psychology | 3 |

Choose two of the following developmental core courses – 6 hrs.

| | | |
|---|---|---|
| PSY 223 | Life Span Developmental Psychology | 3 |
| PSY 353 | Child & Adolescent Psychology | 3 |
| SOC 323 | The Family | 3 |

Additional Psychology Core Electives - 18 hrs.

Choose 18 hours from any above subject area courses not used or from the list below.

| | | |
|---|---|---|
| PSY 313 | Topics in Psychology | 3 |
| PSY 383 | Forensic Psychology | 3 |
| PSY 433 | Issues of Substance Abuse in Family Systems | 3 |
| PSY 443 | Advanced Forensic Psychology | 3 |
| PSY 483 | Counseling Issues in Substance Abuse | 3 |
| PSY 493 | Issues & Ethics in Psychology & Counseling | 3 |
| SOC 313 | Topics in Sociology | 3 |
| SM 393 | Sport Psychology | 3 |

# Business

ASSOCIATE DEGREES:

- ACCOUNTING
- BUSINESS ADMINISTRATION

BACHELOR OF ARTS:

- ATHLETICS AND RECREATION

BACHELOR OF SCIENCE IN BUSINESS ADMINISTRATION MAJORS (BSBA):

- ACCOUNTING
- APPLIED MANAGEMENT
- BUSINESS ADMINISTRATION
- FINANCE
- GOLF MANAGEMENT
- MANAGEMENT
- MARKETING
- SPORT MANAGEMENT

**The School**

Trine University's Ketner School of Business (KSB) was named in honor of Dr. Ralph W. Ketner, a distinguished alumnus and friend of the University. Dr. Ketner is a co-founder of Food Lion, one of the U.S.'s largest supermarket chains.

Courses in accounting and business law date from when the school first opened its doors on June 17, 1884, making the business program the University's oldest continuous course of study.

All undergraduate majors offered in the Ketner School of Business at Trine University are accredited by the Accreditation Council for Business Schools and Programs (ACBSP), www.acbsp.org.

**Mission**

Building tomorrow's business leaders one experience at a time, founded on critical thinking, integrity, passion, personal growth and experiential learning. It's a Trine thing.

**Program Objectives (for all KSB majors)**

1. Demonstrate critical thinking and problem solving abilities in an organization context.
2. Demonstrate effective oral and written communication skills.
3. Demonstrate responsible, appropriate, and effective use of information and communication technology (ICT) tools to access, manage, integrate, analyze, evaluate, create and communicate information.
4. Demonstrate computer skills.
5. Be prepared to seek and grow in a professional career path.

6. Demonstrate ethical acumen both personally and professionally.

**Courses of Study**

The Ketner School of Business offers the programs of study listed at the beginning of this section. In addition, students may earn KSB minors as shown in the programs of study list. A 2.0 cumulative grade point average for all courses in the minor program is required for a minor to be awarded. For transfer students, at least 15 hours of the courses toward a minor must be taken at Trine University. Internship credit of up to six hours can be applied toward a minor, but the internship cannot be double counted (i.e. the hours can be applied to either a major or a minor, but not both).

**Degree Requirements**

Each of the bachelor degrees in the Ketner School of Business requires 120 semester hours unless otherwise specified. Associate degrees in the School of Business require 60 semester hours.

The requirements for both the bachelor degrees and associate degrees involve the following:

1. A liberal arts and sciences curriculum which serves to enrich the academic program so that it constitutes a basic cultural education. Courses in written and oral communication, humanities, social sciences, natural sciences, and mathematics provide basic tools needed for applying knowledge in business administration toward worthwhile goals. The foundation of this curriculum is the general education requirements.

2. A business curriculum that provides the fundamentals through which the entire business enterprise operates.

3. A business specialty curriculum that supplements the business curriculum and allows students to develop a deeper understanding in a specialized area.

4. Business electives that provide for program flexibility and allow students to complement the required credits.

In developing an academic program, each student will have the assistance of a faculty advisor. The student, however, has the ultimate responsibility for meeting specific degree requirements. Prerequisites for individual courses must be carefully observed.

**Double Majors**

Ketner School of Business students may receive double majors. To receive a double major (e.g., management and finance), a student must meet all requirements in both majors and have a minimum of 135 semester hours of credit. Business electives may count in only one major; a single business elective cannot meet the elective requirements for two business majors.

However, a required course in one major can count as an elective in another major.

**Internships**

The Ketner School of Business requires every business student to enter into an internship during his/her course of study at Trine University. Internships are quickly becoming a requirement before a student can be considered for a permanent position by many companies.

The value of an internship to the student, to the sponsoring entity, and to the University/School of Business is considerable.

- The intern gains by actual work experience in a real-world capacity, thus clearly establishing true expectations of the job and profession;

- The company gains by being exposed early to potential employees and by having a chance to evaluate them; and

- The University gains by brokering potential employees and employers and assisting the community.

A maximum of six semester credit hours can be earned toward degree requirements with a maximum of three hours in any one work session. (Golf Management internships are taken for three semester hours.) Internships can take place during any semester

but are especially encouraged during the summer. Advisor approval is required.

**Master of Business Administration (MBA) Preparation for Non-Business Majors**

Students who would like to enter an MBA program after graduation should consider taking the following course. Prerequisites as shown in the Course description section of this catalog must be carefully observed.

**Course Requirements**

| | | |
|---|---|---|
| AC 203 | Accounting I | 3 |
| AC 213 | Accounting II | 3 |
| BA 343 | International Business | 3 |
| ECO 213 | Microeconomics | 3 |
| ECO 223 | Macroeconomics | 3 |
| FIN 303 | Managerial Finance | 3 |
| LAW 203 | Business Law I | 3 |
| MA 253 | Statistics | 3 |
| MGT 353 | Designing Operations | 3 |
| MGT 363 | Organizational Behavior | 3 |
| MK 203 | Marketing | 3 |

# Certificate

## Insurance Certificate

The Insurance Certificate will allow students to demonstrate a basic understanding of insurance principles to prospective employers.

**Outcomes**

1. Analytical Skills
   - data analysis through emerging technology
   - critical thinking
   - analytical skills as it pertains to research, business as usual comparison/reasonability
   - analytical skills using Excel and reading through documents and being able to pull information out
   - Problem solver. Being able to look at something and figuring out where they should start, what approach they would take, etc.
   - statistical analysis
   - Learnability as critical with the rapid pace at which technology and the overall environment is changing.

2. Leadership
   - Able to work in a team setting and individually
   - Collaboration - how to work with others of varying mindsets/personalities/ensuring thinking what's best for the organization and your own growth
   - Independent work and leadership
   - Working independently
   - Time management

3. Communication
   - verbal, oral and written communication skills
   - ability to communicate complex issues clearly
   - negotiation skills/conflict management
   - feedback skills
   - speaking other languages a plus
   - data visualization and presentation

4. Business Operations
   - Basic probability and statistics
   - Project management, communication, business acumen
   - Understanding of reasons for insurance, investments, consumer finance, corporate finance
   - Experience with projects

5. Industry Knowledge
   - Understanding of the core industry functions (UW, pricing, claims, admin)
   - Industry knowledge and accounting/finance background
   - Understanding of reasons for insurance, investments, consumer finance, corporate finance
   - focusing on an end-to-end to know where they want to dive in more. Getting just one piece well great for a SME isn't as beneficial with projects that need the whole landscape view.

6. Experiential learning through meaningful internship.

**Degree Requirements**

Experiential Learning

| | | |
|---|---|---|
| BA 3113 | Business Internship | 3 |

Analytical Skills

Choose one below

| | | |
|---|---|---|
| BA 433 | Business Analytics | 3 |
| MA 253 | Statistics | 3 |
| MA 393 | Probability & Statistics | 3 |
| MA 3093 | Probability | 3 |

Leadership

Choose one below

| | | |
|---|---|---|
| LDR 203 | Leadership Strengths & Skills | 3 |
| MGT 323 | Leadership | 3 |
| MGT 363 | Organizational Behavior | 3 |

Communication

Choose one below

| | | |
|---|---|---|
| COM 213 | Business Communication | 3 |
| ENG 133 | Technical Communication | 3 |

Business Operations

Choose one below

| | | |
|---|---|---|
| FIN 353 | Personal Finance | 3 |
| MGT 383 | Principles of Project Management | 3 |

Industry Knowledge

Choose one below

| | | |
|---|---|---|
| BA 313 | Insurance | 3 |
| FIN 383 | Risk & Insurance | 3 |
| MGT 303 | Risk Management | 3 |

# Associate Degrees

## Associate in Accounting (62 hrs.)

The associate in accounting program is designed to prepare students for immediate entry into the accounting field. It combines a concentration in accounting and computer science with business, economics and general education subjects. This program is especially appropriate for positions in businesses that require a small but knowledgeable accounting staff. As all of the credits are fully transferable to the four-year accounting major at Trine University, it serves as an excellent program for students who subsequently plan to seek a Bachelor of Science degree with an accounting major. A specified number of credit hours must be taken in each section described below. Prerequisites as shown in the Course Descriptions section of this catalog must be carefully observed. Excess credit hours in a section may not ordinarily be counted toward requirements in another section.

**Degree Requirements**

General Education Requirements - 24 hours

Communication – 6 hrs.

| | | |
|---|---|---|
| ENG 133 | Technical Communication | 3 |
| | Or | |
| ENG 143 | College Composition | 3 |
| HUM 203 | Humanities Seminar | 3 |

Humanities and Social Science – 6 hrs.

| | | |
|---|---|---|
| ECO 213 | Microeconomics | 3 |
| | Or | |
| ECO 223 | Macroeconomics | 3 |
| | Humanities Elective (3) | 3 |

Mathematics and Science – 9 hrs.

| | | |
|---|---|---|
| MA 113 | College Algebra | 3 |
| | Science Elective (3) | 3 |
| MA 253 | Statistics | 3 |

Other – 3 hrs.

| | | |
|---|---|---|
| SP 203 | Effective Speaking | 3 |

Additional Requirements - 8 hours

Required

| | | |
|---|---|---|
| BA 201 | Professional Development & Strategies | 1 |

Take one of the below:

| | | |
|---|---|---|
| BA 101 | University Experience for Ketner School of Business | 1 |
| UE 101 | University Experience | 1 |
| UE 111 | Online Learning Orientation | 1 |

Select two of the following courses - 6 hrs.

| | | |
|---|---|---|
| BA 113 | Business Computer Applications | 3 |
| COM 213 | Business Communication | 3 |
| PSY 113 | Principles of Psychology | 3 |

Content Requirements - 30 hours

Associate Business Core - 15 hrs.

| | | |
|---|---|---|
| AC 203 | Accounting I | 3 |
| AC 213 | Accounting II | 3 |
| BA 123 | Business Concepts | 3 |
| LAW 203 | Business Law & Ethics | 3 |
| MK 203 | Marketing | 3 |

Concentration Requirements - 15 hrs.

| | | |
|---|---|---|
| AC 303 | Cost Accounting | 3 |
| AC 323 | Intermediate Accounting I | 3 |
| AC 333 | Intermediate Accounting II | 3 |
| AC 373 | Accounting Information Systems | 3 |
| AC 423 | Personal Income Tax | 3 |
| | Or | |
| AC 463 | Auditing | 3 |

# Associate in Business Administration (62 hrs.)

The associate in business administration degree program is designed to prepare a person for entry into business with a broad understanding of various business activities and their interrelationships. It combines coursework in accounting, finance, marketing, business law, and management. Courses in economics, psychology, mathematics, computer science and communication are all part of this curriculum. Both traditional and non-traditional students will find this program of interest. All credits are transferable to a Trine University four-year business administration degree for those who choose to continue their education. A specified number of credit hours must be taken in each of the following sections. Prerequisites as shown in the Course Descriptions section of this catalog must be carefully observed. Excess credit hours in a section may not ordinarily be counted toward requirements in another section.

**Degree Requirements**

General Education Requirements - 24 hours

Communication – 6 hrs.

| | | |
|---|---|---|
| ENG 133 | Technical Communication | 3 |
| | Or | |
| ENG 143 | College Composition | 3 |

| | | |
|---|---|---|
| HUM 203 | Humanities Seminar | 3 |

Humanities and Social Science – 6 hrs.

| | | |
|---|---|---|
| ECO 213 | Microeconomics | 3 |
| | Or | |
| ECO 223 | Macroeconomics | 3 |
| | Humanities Elective (3) | 3 |

Mathematics and Science – 9 hrs.

| | | |
|---|---|---|
| MA 113 | College Algebra | 3 |
| | Science Elective (3) | 3 |
| MA 253 | Statistics | 3 |

Other – 3 hrs.

| | | |
|---|---|---|
| SP 203 | Effective Speaking | 3 |

Additional Requirements - 8 hours

Required

| | | |
|---|---|---|
| BA 201 | Professional Development & Strategies | 1 |

Take one of the below:

| | | |
|---|---|---|
| BA 101 | University Experience for Ketner School of Business | 1 |
| UE 101 | University Experience | 1 |
| UE 111 | Online Learning Orientation | 1 |

Select two of the following courses - 6 hrs.

| | | |
|---|---|---|
| BA 113 | Business Computer Applications | 3 |
| COM 213 | Business Communication | 3 |
| PSY 113 | Principles of Psychology | 3 |

Content Requirements - 30 hours

Associate Business Core - 15 hrs.

| | | |
|---|---|---|
| AC 203 | Accounting I | 3 |
| AC 213 | Accounting II | 3 |
| BA 123 | Business Concepts | 3 |
| LAW 203 | Business Law & Ethics | 3 |
| MK 203 | Marketing | 3 |

Concentration Requirements - 15 hrs.

| | | |
|---|---|---|
| MGT 363 | Organizational Behavior | 3 |
| | Electives (12) | 12 |

Electives: AC, BA, ECO, ENT, FIN, LAW, LDR, MGT, MK

# Bachelor of Arts

## Bachelor of Arts — Athletics and Recreation Major (120 hrs.)

The Bachelor of Arts in Athletics and Recreation degree at Trine University serves the growing number of students interested in a rewarding career in recreation. It is designed to provide a broad general education in physical activity, sports and sports-related fields.

Graduates of the Bachelor of Arts in Athletics and Recreation program will be prepared to create and administer recreational programs and to succeed in leadership roles in coaching, recreational programming or sports administration. They also will know the requirements to maintain a healthy lifestyle in order to maximize athletic performance.

**Degree Requirements**

General Education Requirements - 41 hours

Communication – 9 hrs.

| | | |
|---|---|---|
| ENG 133 | Technical Communication | 3 |
| | Or | |
| ENG 143 | College Composition | 3 |
| HUM 203 | Humanities Seminar | 3 |
| SP 203 | Effective Speaking | 3 |

Humanities and Social Science – 12 hrs.

| | | |
|---|---|---|
| | Social Science Elective (6) | 6 |
| | Humanities Elective (6) | 6 |

Mathematics and Science – 9 hrs.

| | | |
|---|---|---|
| | Mathematics Elective (3) | 3 |
| | Science Elective (3) | 3 |
| | Math or Science Elective (3) | 3 |

Other – 11 hrs.

| | | |
|---|---|---|
| EXS 102 | Lifetime Wellness | 2 |
| | General Education Electives (3) | 3 |
| BA 113 | Business Computer Applications | 3 |
| PSY 113 | Principles of Psychology | 3 |
| | Or | |
| SM 393 | Sport Psychology | 3 |

Content Requirements - 79 hours

Required - 49 hours

| | | |
|---|---|---|
| UE 101 | University Experience | 1 |
| BA 123 | Business Concepts | 3 |
| COM 163 | Interpersonal Communication | 3 |
| COM 253 | Event Planning & Promotion | 3 |
| MGT 363 | Organizational Behavior | 3 |
| MGT 373 | Facility Management | 3 |
| MGT 403 | Principles of Hospitality Management | 3 |
| MK 203 | Marketing | 3 |
| BA 3113 | Business Internship | 3 |
| SM 133 | Contemporary Issues in Sport | 3 |
| SM 313 | Principles of Sport & Recreation Management | 3 |
| EXS 103 | Teaching Sport Skills I | 3 |
| EXS 203 | Risk and Sports | 3 |
| EXS 243 | Athletic Training | 3 |
| EXS 273 | Nutrition | 3 |
| EXS 283 | Fitness Evaluation Assessment | 3 |
| EXS 483 | Professional Development in Exercise Science | 3 |

Free Electives – 30 hrs.

Electives are determined in conjunction with an advisor and based on student career objectives. At least 15 hours of these free electives must be 300 level classes or above. Minors are recommended to fill these requirements (i.e. Coaching, Sports Psychology, etc.).

# Bachelor of Science in Business Administration Degrees

## Bachelor of Science in Business Administration – Accounting Major (120 hrs.)

In the dynamic and increasingly complex business world, students need to acquire a broad education in addition to specialized skills and knowledge of the profession. Accounting education provides the technical skills necessary to function in today's business environment and provides an understanding of all aspects of business.

UNIFORM CERTIFIED PUBLIC ACCOUNTING EXAMINATION CANDIDATES

The state of Indiana and many other states require that a first-time Uniform Certified Public Accounting (CPA) Examination candidate must have at least 150 semester hours of college credit, including a baccalaureate or higher degree, with an accounting concentration or its equivalent. An accounting major wishing to meet this requirement should plan an individualized program with his or her advisor.

**Degree Requirements**

General Education Requirements - 39 hours

Communication – 12 hrs.

| | | |
|---|---|---|
| ENG 133 | Technical Communication | 3 |
| | Or | |
| ENG 143 | College Composition | 3 |
| HUM 203 | Humanities Seminar | 3 |
| SP 203 | Effective Speaking | 3 |
| COM 213 | Business Communication | 3 |

Humanities and Social Science – 9 hrs.

| | | |
|---|---|---|
| ECO 213 | Microeconomics | 3 |
| ECO 223 | Macroeconomics | 3 |
| | Or | |
| ECO 203 | Survey of Economics | 3 |
| | Social Science Elective (3) | 3 |
| | Humanities Elective (3) | 3 |

Mathematics and Science – 12 hrs.

| | | |
|---|---|---|
| MA 113 | College Algebra | 3 |
| MA 173 | Essential Calculus | 3 |
| | Or | |
| MA 163 | Applied Math w/Business Concepts | 3 |
| MA 253 | Statistics | 3 |
| | Science Elective (3) | 3 |

Other – 6 hrs.

| | | |
|---|---|---|
| BA 213 | Business Spreadsheets | 3 |
| PSY 113 | Principles of Psychology | 3 |

Additional Requirements - 81 hours

Take one of the below:

| | | |
|---|---|---|
| BA 101 | University Experience for Ketner School of Business | 1 |
| BA 102 | University Experience-Business Students | 2 |
| UE 101 | University Experience | 1 |

*UE 111 Online Learning Orientation for students in the online program

Business Core – 37-39hrs.

| | | |
|---|---|---|
| AC 203 | Accounting I | 3 |
| AC 213 | Accounting II | 3 |
| BA 123 | Business Concepts | 3 |
| BA 201 | Professional Development & Strategies | 1 |
| BA 3113 | Business Internship | 3 |
| BA 453 | Global Strategic Management | 3 |
| FIN 303 | Managerial Finance | 3 |
| FIN 353 | Personal Finance | 3 |
| LAW 203 | Business Law & Ethics | 3 |
| MGT 353 | Designing Operations | 3 |
| MGT 363 | Organizational Behavior | 3 |
| MGT 483 | Capstone | 3 |
| MK 203 | Marketing | 3 |

BA 3113: Advisor will determine the appropriate class anywhere between BA 3111 and BA 3113 (1 - 3 credits worth of internship work)

Concentration Requirements - 30 hrs.

| | | |
|---|---|---|
| AC 303 | Cost Accounting | 3 |
| AC 323 | Intermediate Accounting I | 3 |
| AC 333 | Intermediate Accounting II | 3 |
| AC 373 | Accounting Information Systems | 3 |
| AC 403 | Advanced Accounting | 3 |
| AC 423 | Personal Income Tax | 3 |
| AC 463 | Auditing | 3 |
| FIN 413 | Advanced Managerial Finance | 3 |
| | Business Electives (6) | 6 |

Business Electives: 300-400 level from AC or FIN

Electives – 12-14 hrs.

| | | |
|---|---|---|
| | Free Electives (12-14) | 12-14 |

## Bachelor of Science in Business Administration - Applied Management (120 hrs.)

The BSBA with a major in Applied Management degree is designed to prepare an individual with an interest in management in a field where technical competence, has at a minimum, been partially acquired. This program is available to individuals who have already completed some equivalent training in a business, health, technical field, or other specialty area not offered at Trine University. The degree is designed specifically for individuals who acquired training at community colleges, technical institutes, military service schools, industry related schools, etc., and who want to continue their education in the area of

management. The program's goal is to equip students with the quality educational tools needed for a career in management.

TECHNICAL SPECIALTY

Students completing the Bachelor of Applied Management degree program must complete a minimum of 27 semester hours in a business or technical field acquired through occupational, technical training or classroom instruction. As many as 3 additional semester hours in a technical specialty may count as electives.

**Degree Requirements**

General Education Requirements - 39 hours

Communication – 12 hrs.

| | | |
|---|---|---|
| ENG 133 | Technical Communication | 3 |
| | Or | |
| ENG 143 | College Composition | 3 |
| HUM 203 | Humanities Seminar | 3 |
| SP 203 | Effective Speaking | 3 |
| COM 213 | Business Communication | 3 |

Humanities and Social Science – 9 hrs.

| | | |
|---|---|---|
| ECO 213 | Microeconomics | 3 |
| ECO 223 | Macroeconomics | 3 |
| | Or | |
| ECO 203 | Survey of Economics | 3 |
| | Social Science Elective (3) | 3 |
| | Humanities Elective (3) | 3 |

Mathematics and Science – 12 hrs.

| | | |
|---|---|---|
| MA 113 | College Algebra | 3 |
| MA 173 | Essential Calculus | 3 |
| | Or | |
| MA 163 | Applied Math w/Business Concepts | 3 |
| MA 253 | Statistics | 3 |
| | Science Elective (3) | 3 |

Other – 6 hrs.

| | | |
|---|---|---|
| BA 213 | Business Spreadsheets | 3 |
| PSY 113 | Principles of Psychology | 3 |

Additional Requirements - 81 hours

Take one of the below:

| | | |
|---|---|---|
| BA 101 | University Experience for Ketner School of Business | 1 |
| BA 102 | University Experience-Business Students | 2 |
| UE 101 | University Experience | 1 |

*UE 111 Online Learning Orientation for students in the online program

Business Core – 37 - 39 hrs.

| | | |
|---|---|---|
| AC 203 | Accounting I | 3 |
| AC 213 | Accounting II | 3 |
| BA 123 | Business Concepts | 3 |
| BA 201 | Professional Development & Strategies | 1 |
| BA 3113 | Business Internship | 3 |
| BA 453 | Global Strategic Management | 3 |
| FIN 303 | Managerial Finance | 3 |
| FIN 353 | Personal Finance | 3 |
| LAW 203 | Business Law & Ethics | 3 |
| MGT 353 | Designing Operations | 3 |
| MGT 363 | Organizational Behavior | 3 |
| MGT 483 | Capstone | 3 |
| MK 203 | Marketing | 3 |

BA 3111 - BA 3113: Advisor will determine the appropriate class anywhere between BA 3111 and BA 3113 (1 -3 credits worth of internship work)

Concentration Requirements - 30 hrs.

Business courses with approval of Advisor or Chair – Student must be transferring in all 27 hours of a technical field/concentration. If a student can't transfer in all 27 hours, it must be a field that can be completed at Trine such as Criminal Justice. If the student does not have 27 hours and it can't be completed at Trine, the transfer credits can't be accepted as an applied management concentration. They should be considered as a normal transfer evaluation.

| | | |
|---|---|---|
| | Technical Field/Concentration Courses | 27 |
| | Business Elective/Technical Specialty (3) | 3 |

Business Elective/Technical Specialty: AC, ENT, FIN, HR, LAW, LDR, MGT, MK

Electives – 12-14 hrs.

| | | |
|---|---|---|
| | Free Electives (12-14) | 12-14 |

## Bachelor of Science in Business Administration - Business Administration (120 hrs.)

**Degree Requirements**

General Education Requirements - 39 hours

Communication – 12 hrs.

| | | |
|---|---|---|
| ENG 133 | Technical Communication | 3 |
| | Or | |
| ENG 143 | College Composition | 3 |
| HUM 203 | Humanities Seminar | 3 |
| SP 203 | Effective Speaking | 3 |
| COM 213 | Business Communication | 3 |

Humanities and Social Science – 9 hrs.

| | | |
|---|---|---|
| ECO 213 | Microeconomics | 3 |
| ECO 223 | Macroeconomics | 3 |
| | Or | |
| ECO 203 | Survey of Economics | 3 |
| | Social Science Elective (3) | 3 |

| | | |
|---|---|---|
| | Humanities Elective (3) | 3 |

Mathematics and Science – 12 hrs.

| | | |
|---|---|---|
| MA 113 | College Algebra | 3 |
| MA 173 | Essential Calculus | 3 |
| | Or | |
| MA 163 | Applied Math w/Business Concepts | 3 |
| MA 253 | Statistics | 3 |
| | Science Elective (3) | 3 |

Other – 6 hrs.

| | | |
|---|---|---|
| BA 213 | Business Spreadsheets | 3 |
| PSY 113 | Principles of Psychology | 3 |

Additional Requirements - 81 hours

Take one of the below:

| | | |
|---|---|---|
| BA 101 | University Experience for Ketner School of Business | 1 |
| BA 102 | University Experience-Business Students | 2 |
| UE 101 | University Experience | 1 |

*UE 111 Online Learning Orientation for students in the online program

Business Core – 37 - 39 hrs.

| | | |
|---|---|---|
| AC 203 | Accounting I | 3 |
| AC 213 | Accounting II | 3 |
| BA 123 | Business Concepts | 3 |
| BA 201 | Professional Development & Strategies | 1 |
| BA 3113 | Business Internship | 3 |
| BA 453 | Global Strategic Management | 3 |
| FIN 303 | Managerial Finance | 3 |
| FIN 353 | Personal Finance | 3 |
| LAW 203 | Business Law & Ethics | 3 |
| MGT 353 | Designing Operations | 3 |
| MGT 363 | Organizational Behavior | 3 |
| MGT 483 | Capstone | 3 |
| MK 203 | Marketing | 3 |

BA 3111 - BA 3113: Advisor will determine the appropriate class anywhere between BA 3111 and BA 3113 (1 - 3 credits worth of internship work)

Concentration Requirements - 30 hrs.

| | | |
|---|---|---|
| AC 303 | Cost Accounting | 3 |
| AC 373 | Accounting Information Systems | 3 |
| BA 433 | Business Analytics | 3 |
| MGT 303 | Risk Management | 3 |
| MGT 313 | Human Resource Management | 3 |
| MGT 323 | Leadership | 3 |
| MK 323 | Integrated Marketing Communication | 3 |
| | Business Electives (9) | 9 |

Business elective: 300 - 400 level from AC, BA, ECO, ENT, FIN, HR, LAW, LDR, MGT, MK (9 hours)

Electives – 12-14 hrs.

| | | |
|---|---|---|
| | Free Electives (12-14) | 12-14 |

# Bachelor of Science in Business Administration - Finance Major (120 hrs.)

**Degree Requirements**

General Education Requirements - 39 hours

Communication – 12 hrs.

| | | |
|---|---|---|
| ENG 133 | Technical Communication | 3 |
| | Or | |
| ENG 143 | College Composition | 3 |
| HUM 203 | Humanities Seminar | 3 |
| SP 203 | Effective Speaking | 3 |
| COM 213 | Business Communication | 3 |

Humanities and Social Science – 9 hrs.

| | | |
|---|---|---|
| ECO 213 | Microeconomics | 3 |
| ECO 223 | Macroeconomics | 3 |
| | Or | |
| ECO 203 | Survey of Economics | 3 |
| | Social Science Elective (3) | 3 |
| | Humanities | 3 |

Mathematics and Science – 12 hrs.

| | | |
|---|---|---|
| MA 113 | College Algebra | 3 |
| MA 173 | Essential Calculus | 3 |
| | Or | |
| MA 163 | Applied Math w/Business Concepts | 3 |
| MA 253 | Statistics | 3 |
| | Science Elective (3) | 3 |

Other – 6 hrs.

| | | |
|---|---|---|
| BA 213 | Business Spreadsheets | 3 |
| PSY 113 | Principles of Psychology | 3 |

Additional Requirements - 81 hours

Take one of the below:

| | | |
|---|---|---|
| BA 101 | University Experience for Ketner School of Business | 1 |
| BA 102 | University Experience-Business Students | 2 |
| UE 101 | University Experience | 1 |

*UE 111 Online Learning Orientation for students in the online program

Business Core – 37-39 hrs.

| | | |
|---|---|---|
| AC 203 | Accounting I | 3 |
| AC 213 | Accounting II | 3 |
| BA 123 | Business Concepts | 3 |
| BA 201 | Professional Development & Strategies | 1 |
| BA 3113 | Business Internship | 3 |
| BA 453 | Global Strategic Management | 3 |
| FIN 303 | Managerial Finance | 3 |
| FIN 353 | Personal Finance | 3 |
| LAW 203 | Business Law & Ethics | 3 |
| MGT 353 | Designing Operations | 3 |
| MGT 363 | Organizational Behavior | 3 |
| MGT 483 | Capstone | 3 |
| MK 203 | Marketing | 3 |

BA 3113: Advisor will determine the appropriate class anywhere between BA 3111 and BA 3113 (1 - 3 credits worth of internship work)

Concentration Requirements - 30 hrs.

| | | |
|---|---|---|
| AC 423 | Personal Income Tax | 3 |
| FIN 323 | Money & Banking | 3 |
| FIN 403 | Investments | 3 |
| FIN 413 | Advanced Managerial Finance | 3 |
| FIN 473 | Finance Modeling | 3 |

Corporate Track:

| | | |
|---|---|---|
| AC 303 | Cost Accounting | 3 |
| FIN 343 | International Finance | 3 |
| | Accounting or Finance Electives (9) | 9 |

AC, BUS, MGT, MK, or FIN Electives: 300 level or above, including Graduate courses

Wealth Management Track:

| | | |
|---|---|---|
| FIN 383 | Risk & Insurance | 3 |
| FIN 423 | Portfolio & Wealth Planning | 3 |
| MK 423 | Professional Selling | 3 |
| | Accounting or Finance Elective (6) | 6 |

AC, BUS, MGT, MK, or FIN Electives: 300 level or above, including Graduate courses

Electives – 12-14 hrs.

| | | |
|---|---|---|
| | Free Electives (12-14) | 12-14 |

## Bachelor of Science in Business Administration - Golf Management Major (120 hrs.)

The Bachelor of Science in Business Administration Golf Management major prepares students to become trained professionals ready for immediate employment in the golfing industry. The program incorporates a business administration core with a concentration in golf management coursework, including golf course promotion, turf management, and marketing strategies.

**Degree Requirements**

General Education Requirements - 39 hours

Communication – 12 hrs.

| | | |
|---|---|---|
| ENG 133 | Technical Communication | 3 |
| | Or | |

| | | |
|---|---|---|
| ENG 143 | College Composition | 3 |
| HUM 203 | Humanities Seminar | 3 |
| SP 203 | Effective Speaking | 3 |
| COM 213 | Business Communication | 3 |

Humanities and Social Science – 9 hrs.

| | | |
|---|---|---|
| ECO 213 | Microeconomics | 3 |
| ECO 223 | Macroeconomics | 3 |
| | Or | |
| ECO 203 | Survey of Economics | 3 |
| | Social Science Elective (3) | 3 |
| | Humanities Elective (3) | 3 |

Mathematics and Science – 12 hrs.

| | | |
|---|---|---|
| MA 113 | College Algebra | 3 |
| MA 173 | Essential Calculus | 3 |
| | Or | |
| MA 163 | Applied Math w/Business Concepts | 3 |
| MA 253 | Statistics | 3 |
| | Science Elective (3) | 3 |

Other – 6 hrs.

| | | |
|---|---|---|
| BA 213 | Business Spreadsheets | 3 |
| PSY 113 | Principles of Psychology | 3 |

Additional Requirements - 81 hours

Take one of the below:

| | | |
|---|---|---|
| BA 101 | University Experience for Ketner School of Business | 1 |
| BA 102 | University Experience-Business Students | 2 |
| UE 101 | University Experience | 1 |

*UE 111 Online Learning Orientation for students in the online program

Business Core – 37 - 39 hrs.

| | | |
|---|---|---|
| AC 203 | Accounting I | 3 |
| AC 213 | Accounting II | 3 |
| BA 123 | Business Concepts | 3 |
| BA 201 | Professional Development & Strategies | 1 |
| BA 3113 | Business Internship | 3 |
| BA 453 | Global Strategic Management | 3 |
| FIN 303 | Managerial Finance | 3 |
| FIN 353 | Personal Finance | 3 |
| LAW 203 | Business Law & Ethics | 3 |
| MGT 353 | Designing Operations | 3 |
| MGT 363 | Organizational Behavior | 3 |
| MGT 483 | Capstone | 3 |
| MK 203 | Marketing | 3 |

BA 3113: Advisor will determine the appropriate class anywhere between BA 3111 and BA 3113 (1 - 3 credits worth of internship work).

Concentration Requirements - 30 hrs.

| | | |
|---|---|---|
| GM 131 | Player Development I | 1 |
| GM 203 | Golf Shop Management | 3 |
| GM 213 | Club Design, Repair & Fitting | 3 |
| GM 323 | Teaching the Golf Swing | 3 |
| GM 462 | Senior Seminar in Golf Management | 2 |
| MGT 403 | Principles of Hospitality Management | 3 |

Management Core

| | | |
|---|---|---|
| MGT 303 | Risk Management | 3 |
| MGT 313 | Human Resource Management | 3 |
| MGT 323 | Leadership | 3 |
| MGT 383 | Principles of Project Management | 3 |
| | Marketing Elective (3) | 3 |

Marketing Elective: 300-400 Level

Electives – 12-14 hrs.

| | | |
|---|---|---|
| | Free Electives (12-14) | 12-14 |

## Bachelor of Science in Business Administration - Management Major (120 hrs.)

Management pervades all facets of a business organization. Operations management studies the manufacturing and service processes where many new quantitative techniques are applied. Human resources involves the study of the human factor in business organizations. Students who select this major are preparing themselves for positions in firms regardless of size or organizational structure.

**Degree Requirements**

General Education Requirements - 39 hours

Communication – 12 hrs.

| | | |
|---|---|---|
| ENG 133 | Technical Communication | 3 |
| | Or | |
| ENG 143 | College Composition | 3 |
| HUM 203 | Humanities Seminar | 3 |
| SP 203 | Effective Speaking | 3 |
| COM 213 | Business Communication | 3 |

Humanities and Social Science – 9 hrs.

| | | |
|---|---|---|
| ECO 213 | Microeconomics | 3 |
| ECO 223 | Macroeconomics | 3 |
| | Or | |
| ECO 203 | Survey of Economics | 3 |
| | Social Science Elective (3) | 3 |
| | Humanities | 3 |

Mathematics and Science – 12 hrs.

| | | |
|---|---|---|
| MA 113 | College Algebra | 3 |
| MA 173 | Essential Calculus | 3 |
| | Or | |
| MA 163 | Applied Math w/Business Concepts | 3 |
| MA 253 | Statistics | 3 |
| | Science Elective (3) | 3 |

Other – 6 hrs.

| | | |
|---|---|---|
| BA 213 | Business Spreadsheets | 3 |
| PSY 113 | Principles of Psychology | 3 |

Additional Requirements - 81 hours

Take one of the below:

| | | |
|---|---|---|
| BA 101 | University Experience for Ketner School of Business | 1 |
| BA 102 | University Experience-Business Students | 2 |
| UE 101 | University Experience | 1 |

*UE 111 Online Learning Orientation for students in the online program

Business Core – 35-37 hrs.

| | | |
|---|---|---|
| AC 203 | Accounting I | 3 |
| AC 213 | Accounting II | 3 |
| BA 123 | Business Concepts | 3 |
| BA 201 | Professional Development & Strategies | 1 |
| BA 3113 | Business Internship | 3 |
| BA 453 | Global Strategic Management | 3 |
| FIN 303 | Managerial Finance | 3 |
| FIN 353 | Personal Finance | 3 |
| LAW 203 | Business Law & Ethics | 3 |
| MGT 353 | Designing Operations | 3 |
| MGT 363 | Organizational Behavior | 3 |
| MGT 483 | Capstone | 3 |
| MK 203 | Marketing | 3 |

BA 3111 - BA 3113: Advisor will determine the appropriate class anywhere between BA 3111 and BA 3113 (1 - 3 credits worth of internship work).

Concentration Requirements - 30 hrs.

| | | |
|---|---|---|
| MGT 303 | Risk Management | 3 |
| MGT 313 | Human Resource Management | 3 |
| MGT 323 | Leadership | 3 |
| MGT 383 | Principles of Project Management | 3 |
| BA 433 | Business Analytics | 3 |
| | Management Elective (6) | 6 |
| | Business Electives (9) | 9 |

Management Electives - Choose any MGT 300/400 Level courses for a total of 6 hrs.

Business Electives - Complete 9 hours of applicable courses with the following prefixes that align with student career goals and based upon advisor recommendation and approval (AC, BA, COM, ECO, ENT, FIN, GM, HC, HR, INF, LAW, LDR, MGT,

MK, SM), including but not limited to the below optional tracks.

Human Resource Track:
LAW 403 Employment Law or HR 303 Compensation & Benefits
HR 323 Safety & Health Management
MGT 343 Human Resource Development

Information Systems Track:
CSIT 103 Introduction to Information Systems
CSIT 153 Introduction to Operating Systems
CSIT 223 Network Management

Leadership Track:
LDR 403 Creativity, Innovation, and Influence
LDR 433 Leadership Practicum
MGT 333 Supervision

Operations/Supply Chain Management Track:
MGT 373 Facility Management
MGT 413 Management of Quality
MGT 423 Supply Chain Management

General Management Track:
MGT Electives - Choose any MGT 300/400 Level courses for a total of 9 hrs.

Electives – 12-14 hrs.

| | | |
|---|---|---|
| | Free Electives (12-14) | 12-14 |

## Bachelor of Science in Business Administration - Marketing Major (120 hrs.)

Marketing involves creating and satisfying the demands of consumers. It is the study of the organizations and systems involved in the rendering of personal services to the consumer and the physical distribution of goods from the producer to the consumer. The marketing major will discover career opportunities in the fields of sales management, advertising, market research, retailing, brand/product management, merchandising, and marketing management.

**Degree Requirements**

General Education Requirements - 39 hours

Communication – 12 hrs.

| | | |
|---|---|---|
| ENG 133 | Technical Communication | 3 |
| | Or | |
| ENG 143 | College Composition | 3 |
| HUM 203 | Humanities Seminar | 3 |
| SP 203 | Effective Speaking | 3 |
| COM 213 | Business Communication | 3 |

Humanities and Social Science – 9 hrs.

| | | |
|---|---|---|
| ECO 213 | Microeconomics | 3 |
| ECO 223 | Macroeconomics | 3 |
| | Or | |
| ECO 203 | Survey of Economics | 3 |
| | Social Science Elective (3) | 3 |

| | | |
|---|---|---|
| | Humanities | 3 |

Mathematics and Science – 12 hrs.

| | | |
|---|---|---|
| MA 113 | College Algebra | 3 |
| MA 173 | Essential Calculus | 3 |
| | Or | |
| MA 163 | Applied Math w/Business Concepts | 3 |
| MA 253 | Statistics | 3 |
| | Science Elective (3) | 3 |

Other – 6 hrs.

| | | |
|---|---|---|
| BA 213 | Business Spreadsheets | 3 |
| PSY 113 | Principles of Psychology | 3 |

Additional Requirements - 81 hours

Take one of the below:

| | | |
|---|---|---|
| BA 101 | University Experience for Ketner School of Business | 1 |
| BA 102 | University Experience-Business Students | 2 |
| UE 101 | University Experience | 1 |

*UE 111 Online Learning Orientation for students in the online program

Business Core – 37 - 39 hrs.

| | | |
|---|---|---|
| AC 203 | Accounting I | 3 |
| AC 213 | Accounting II | 3 |
| BA 123 | Business Concepts | 3 |
| BA 201 | Professional Development & Strategies | 1 |
| BA 3113 | Business Internship | 3 |
| FIN 303 | Managerial Finance | 3 |
| FIN 353 | Personal Finance | 3 |
| LAW 203 | Business Law & Ethics | 3 |
| MGT 353 | Designing Operations | 3 |
| MGT 363 | Organizational Behavior | 3 |
| MK 203 | Marketing | 3 |
| BA 453 | Global Strategic Management | 3 |
| MGT 483 | Capstone | 3 |

BA 3111 - BA 3113: Advisor will determine the appropriate class (anywhere between 1 and 3 credits per internship)

Concentration Requirements - 30 hrs.

| | | |
|---|---|---|
| MK 323 | Integrated Marketing Communication | 3 |
| MK 363/PSY 3063 | Commerce and Consumer Behavior | 3 |
| MK 423 | Professional Selling | 3 |
| MK 433 | Marketing Strategy | 3 |
| MK 463 | Marketing Research | 3 |
| | Marketing Elective (6) | 6 |
| | Business Electives (9) | 9 |

Marketing Electives - Choose any MK 300/400 Level courses for a total of 6 hrs.

Business Electives - Complete 9 hours of applicable courses with the following prefixes that align with student career goals and based upon advisor recommendation and approval (AC, BA, COM, ECO, ENT, FIN, GM, HC, HR, INF, LAW, LDR, MGT, MK, SM), including but not limited to the below optional tracks.

Marketing Analytics Track:
BA 433 Business Analytics
INF 263 Data Management
INF 393 Data Visualization

Marketing Management Track:
MGT 323 Leadership
BA 433 Business Analytics
MGT 383 Principles of Project Management

Media Creation/Creativity Track:
MK 373 Graphic Design Fundamentals
COM 243 Digital Media Creation
COM 343 Web Content Management

Sales Track:
MK 423 Professional Selling
BA 433 Business Analytics
COM 233 Intercultural Communication

General Marketing Track:
MK Electives - Choose any MGT 300/400 Level courses for a total of 9 hrs.

Electives – 12-14 hrs.

| | | |
|---|---|---|
| | Free Electives (12-14) | 12-14 |

## Bachelor of Science in Business Administration - Sport Management Major (120 hrs.)

The Bachelor of Science in Business Administration Sport Management degree program was developed to meet the demand in collegiate and professional sports for business professionals who possess an extensive knowledge of sport and an understanding of the concerns and needs of athletes. Graduates of this program will work with personnel and marketing professionals to promote, regulate, and administer collegiate and professional sport programs.

**Degree Requirements**

General Education Requirements - 39 hours

Communication – 12 hrs.

| | | |
|---|---|---|
| ENG 133 | Technical Communication | 3 |
| | Or | |
| ENG 143 | College Composition | 3 |
| HUM 203 | Humanities Seminar | 3 |
| SP 203 | Effective Speaking | 3 |
| COM 213 | Business Communication | 3 |

Humanities and Social Science – 9 hrs.

| | | |
|---|---|---|
| ECO 213 | Microeconomics | 3 |
| ECO 223 | Macroeconomics | 3 |
| | Or | |

| | | |
|---|---|---|
| ECO 203 | Survey of Economics | 3 |
| | Social Science Elective (3) | 3 |
| | Humanities Elective (3) | 3 |

Mathematics and Science – 12 hrs.

| | | |
|---|---|---|
| MA 113 | College Algebra | 3 |
| MA 173 | Essential Calculus | 3 |
| | Or | |
| MA 163 | Applied Math w/Business Concepts | 3 |
| MA 253 | Statistics | 3 |
| | Science Elective (3) | 3 |

Other – 6 hrs.

| | | |
|---|---|---|
| BA 213 | Business Spreadsheets | 3 |
| PSY 113 | Principles of Psychology | 3 |

Additional Requirements - 81 hours

Take one of the below:

| | | |
|---|---|---|
| BA 101 | University Experience for Ketner School of Business | 1 |
| BA 102 | University Experience-Business Students | 2 |
| UE 101 | University Experience | 1 |

*UE 111 Online Learning Orientation for students in the online program

Business Core – 37 - 39 hrs.

| | | |
|---|---|---|
| AC 203 | Accounting I | 3 |
| AC 213 | Accounting II | 3 |
| BA 123 | Business Concepts | 3 |
| BA 201 | Professional Development & Strategies | 1 |
| BA 3113 | Business Internship | 3 |
| BA 453 | Global Strategic Management | 3 |
| FIN 303 | Managerial Finance | 3 |
| FIN 353 | Personal Finance | 3 |
| LAW 203 | Business Law & Ethics | 3 |
| MGT 353 | Designing Operations | 3 |
| MGT 363 | Organizational Behavior | 3 |
| MGT 483 | Capstone | 3 |
| MK 203 | Marketing | 3 |

BA 3111 - BA 3113: Advisor will determine the appropriate class anywhere between BA 3111 and BA 3113 (1 - 3 credits worth of internship work)

Concentration Requirements - 30 hrs.

| | | |
|---|---|---|
| MGT 403 | Principles of Hospitality Management | 3 |
| SM 133 | Contemporary Issues in Sport | 3 |
| SM 313 | Principles of Sport & Recreation Management | 3 |
| SM 333 | Sports Law and Ethics | 3 |
| SM 423 | Capstone Experience in Sport Management | 3 |

Management Core

| | | |
|---|---|---|
| MGT 303 | Risk Management | 3 |
| MGT 383 | Principles of Project Management | 3 |
| | Marketing Elective (3) | 3 |
| | Business Electives (6) | 6 |

MK Elective 300-400 Level (3 hrs.)

Business Elective - AC, BA, ECO, ENT, FIN, HR, LAW, LDR, MGT, MK 300-400 Level (6 hrs.)

Electives – 12-14 hrs.

| | | |
|---|---|---|
| | Free Electives (12-14) | 12-14 |

# Education

BACHELOR OF SCIENCE WITH MAJORS IN:

- EDUCATION STUDIES
- ELEMENTARY EDUCATION
- ELEMENTARY/MONTESSORI ELEMENTARY I DUAL LICENSURE
- ELEMENTARY/SPECIAL EDUCATION MILD INTERVENTION DUAL LICENSURE
- ENGLISH/LANGUAGE ARTS EDUCATION
- ENGLISH/LANGUAGE ARTS EDUCATION/SPECIAL EDUCATION MILD INTERVENTION DUAL LICENSURE
- HEALTH/PHYSICAL EDUCATION
- HEALTH/PHYSICAL EDUCATION/SPECIAL EDUCATION MILD INTERVENTION DUAL LICENSURE
- LIFE SCIENCE (BIOLOGY) EDUCATION (5-12)
- LIFE SCIENCE (BIOLOGY) EDUCATION (5-12)/SPECIAL EDUCATION MILD INTERVENTION DUAL LICENSURE (P-12)
- MATHEMATICS EDUCATION
- MATHEMATICS EDUCATION/SPECIAL EDUCATION MILD INTERVENTION DUAL LICENSURE
- SCIENCE/CHEMISTRY EDUCATION (5-12)
- SCIENCE/CHEMISTRY (5-12)/SPECIAL EDUCATION MILD INTERVENTION DUAL LICENSURE (P-12)
- SOCIAL STUDIES EDUCATION
- SOCIAL STUDIES EDUCATION/SPECIAL EDUCATION MILD INTERVENTION DUAL LICENSURE

TRANSITION TO TEACHING GRADUATE CERTIFICATE

- ELEMENTARY EDUCATION PEDAGOGY
- SECONDARY EDUCATION PEDAGOGY
- SPECIAL EDUCATION MILD PREVENTION

MASTER OF EDUCATION PROGRAMS

- MASTER OF EDUCATION IN EARLY CHILDHOOD MONTESSORI EDUCATION
- MASTER OF EDUCATION IN ELEMENTARY I MONTESSORI EDUCATION
- MASTER OF EDUCATION IN ELEMENTARY PEDAGOGY
- MASTER OF EDUCATION IN SECONDARY PEDAGOGY
- MASTER OF EDUCATION IN SPECIAL EDUCATION PEDAGOGY

**Trine University's Franks School of Education includes this department:**

- SHEVENAUGH DEPARTMENT OF ELEMENTARY EDUCATION

*Information presented here is subject to change at any time, depending on actions taken by the Indiana Department of Education/Office of Educator Effectiveness and Licensing. Students are responsible for meeting any requirements for licensure that are in effect at the time they seek to be licensed. The requirements may differ from what is presented in this document. Students should remain alert to changes in requirements. Updated information is available from the Franks School of Education.*

**The School**

The Franks School of Education was named in honor of Lawrence A. Franks, a 1959 mechanical engineering graduate and an emeritus member of the University's Board of Trustees.

Established in 1884 by a group of Angola citizens, the University began as part of the normal school movement that spread throughout much of the United States during the last half of the nineteenth century. The initial course of study at Tri-State Normal College included teacher education and commerce. In 1921, Frances Kain Shevenaugh earned her "teaching certificate" at Tri-State by completing a twelve-week course of study. In June, 2001, the University reorganized its basic structure to make education a visible component. To renew the tradition of serving the needs of public education in the service area and beyond, the School of Education was created.

**Accreditation**

The Trine University Franks School of Education is accredited by the Council for the Accreditation of Educator Preparation (CAEP) and the Indiana Department of Education/Office of Educator Effectiveness and Licensing (IDOE).

**Mission of the School**

The mission of the Franks School of Education at Trine University is to provide a supportive and challenging educational environment where teacher candidates embody the professional knowledge, skills, and dispositions required to positively impact the academic and social growth of all learners.

**Professional Commitments and Dispositions**

The Franks School of Education has adopted the principles developed by the Council of Chief State School Officers (CCSSO) and the Interstate Teacher Candidate Assessment and Support Consortium (InTASC) as program performance learning outcomes (PO). This set of model core teaching standards outlines what teachers should know and be able to do to ensure every P-12 student succeeds.

1. **Learner Development**. The teacher candidate understands how learners grow and develop, recognizing that patterns of learning and development vary individually within and across the cognitive, linguistic, social, emotional, and physical areas, and designs and implements developmentally appropriate and challenging learning experiences.

2. **Learning Differences**. The teacher candidate uses understanding of individual differences and diverse cultures and communities to ensure inclusive learning environments that enable each learner to meet high standards.

3. **Learning Environments**. The teacher candidate works with others to create environments that support individual and collaborative learning, and that encourage positive social interaction, active engagement in learning, and self-motivation.

4. **Content Knowledge**. The teacher candidate understands the central concepts, tools of inquiry, and structures of discipline(s) he or she teaches and creates learning experiences that make the discipline accessible and meaningful for learners to assure mastery of the content.

5. **Application of Content**. The teacher candidate understands how to connect concepts and use differing perspectives to engage learners in critical thinking, creativity, and collaborative problem solving related to authentic local and global issues.

6. **Assessment**. The teacher candidate understands and uses multiple methods of assessment to engage learners in their own

growth, to monitor learner progress, and to guide the teacher's and learner's decision making.

7. **Planning for Instruction**. The teacher candidate plans instruction that supports every student in meeting rigorous learning goals by drawing upon knowledge of content areas, curriculum, cross-disciplinary skills, and pedagogy, as well as knowledge of learners and the community context.

8. **Instructional Strategies**. The teacher candidate understands and uses a variety of instructional strategies to encourage learners to develop deep understanding of content areas and their connections, and to build skill to apply knowledge in meaningful ways.

9. **Professional Learning and Ethical Practice**. The teacher candidate engages in ongoing professional learning and uses evidence to continually evaluate his/her practice, particularly the effects of his/her choices and actions on others (learners, families, other professionals, and the community), and adapts practice to meet the needs of each learner.

10. **Leadership and Collaboration**. The teacher candidate seeks appropriate leadership roles and opportunities to take responsibility for student learning and development, to collaborate with learners, families, colleagues, other school professionals, and community members to ensure learner growth, and to advance the profession.

**Admission to Professional Education Sequence**

Before taking the majority of EDU courses, which begins EDU 301 and EDU 303, teacher candidates must be officially admitted to the professional education sequence. To apply for the professional education sequence, teacher candidates must demonstrate basic skills competency by earning passing scores on the reading, mathematics, and writing sections of Praxis 1 (CORE) assessment or qualifying ACT/SAT scores, earn a 3.0 accumulative Trine GPA through at least 24 credit hours, complete an application form and clean criminal background check, and submit a positive letter of recommendation from academic advisor.

Transfer students must meet similar requirements. The Franks School of Education should be contacted for further details (260.665.4121).

**Approved Programs**

All teacher preparation programs are approved by the Indiana Department of Education/Office of Educator Effectiveness and Licensing.

**Approved programs include the following:**

- **Chemistry Education (5-12)**
- **Chemistry Education (5-12)/Special Education Mild Intervention Dual Licensure (P-12)**
- **Elementary Education (K-6)**
- **Elementary Education/Special Education Mild Intervention Dual Licensure (P-12)**
- **English/Language Arts Education (5-12)**
- **English/Language Arts Education (5-12)/Special Education Mild Intervention Dual Licensure (P-12)**
- **Health/Physical Education (P-12)**
- **Health/Physical Education (P-12)/Special Education Mild Intervention Dual Licensure (P-12)**
- **Life Science (Biology) Education (5-12)**
- **Life Science (Biology) Education (5-12)/Special Education Mild Intervention Dual Licensure (P-12)**
- **Mathematics Education (5 -12)**

- **Mathematics Education (5 -12)/Special Education Mild Intervention Dual Licensure (P-12)**
- **Social Studies Education (5 -12)**
- **Social Studies Education (5 -12)/Special Education Mild Intervention Dual Licensure (P-12)**

Social studies education majors must choose at least one content area from economics, government and citizenship, historical perspectives, and/or psychology.

Applicable standards for each program are InTASC general standards, IDOE/OEEL developmental standards, and IDOE/OEEL content standards.

**Remaining in Professional Education Sequence**

Once officially admitted, retention in the professional education sequence is contingent upon good academic standing and successful passing of all Franks School of Education (FSOE) requirements. The GPA required for admission is 3.0 overall.

**Testing Requirements**

To be eligible for admission to the professional education sequence, FSOE determined passing scores on Praxis CORE assessment or qualifying ACT/SAT scores must be submitted. To be eligible for Indiana teaching licensure, State of Indiana passing score(s) on required content area assessment and developmental (pedagogy) area assessment must be submitted. The Franks School of Education should always be consulted before a test is taken to ensure most recent testing requirements are met.

**Student Teaching**

Student teaching is completed in an area school, generally within 40 miles of the University, as assigned by the placement coordinator for the Franks School of Education. The traditional student teacher participates in a classroom with a cooperating teacher for 16 full weeks. To be eligible for licensure, the teacher candidate must have earned an overall GPA of 3.0 or higher, a GPA of 3.0 or higher in all areas of licensure, must have successfully completed student teaching with a GPA of 3.0 or higher, and must have met all FSOE-determined requirements at established levels.

**Licensing Advisor**

Trine University’s licensing advisor is the Dean of the Franks School of Education.

# Bachelor of Science with a Major in Degrees

BACHELOR OF SCIENCE WITH MAJORS IN:

- EDUCATION STUDIES
- ELEMENTARY EDUCATION
- ELEMENTARY/MONTESSORI ELEMENTARY I DUAL LICENSURE
- ELEMENTARY/SPECIAL EDUCATION MILD INTERVENTION DUAL LICENSURE
- ENGLISH/LANGUAGE ARTS EDUCATION
- ENGLISH/LANGUAGE ARTS EDUCATION/SPECIAL EDUCATION MILD INTERVENTION DUAL LICENSURE
- HEALTH/PHYSICAL EDUCATION
- HEALTH/PHYSICAL EDUCATION/SPECIAL EDUCATION MILD INTERVENTION DUAL LICENSURE
- LIFE SCIENCE (BIOLOGY) EDUCATION (5-12)

- LIFE SCIENCE (BIOLOGY) EDUCATION (5-12)/SPECIAL EDUCATION MILD INTERVENTION DUAL LICENSURE (P-12)
- MATHEMATICS EDUCATION
- MATHEMATICS EDUCATION/SPECIAL EDUCATION MILD INTERVENTION DUAL LICENSURE
- SCIENCE/CHEMISTRY EDUCATION (5-12)
- SCIENCE/CHEMISTRY (5-12)/SPECIAL EDUCATION MILD INTERVENTION DUAL LICENSURE (P-12)
- SOCIAL STUDIES EDUCATION
- SOCIAL STUDIES EDUCATION/SPECIAL EDUCATION MILD INTERVENTION DUAL LICENSURE

## Bachelor of Science Education Studies (Non-Licensure) (120 hrs.)

**Degree Requirements**

General Education Requirements - 42 hours

Communication – 9 hrs.

| | | |
|---|---|---|
| ENG 143 | College Composition | 3 |
| HUM 203 | Humanities Seminar | 3 |
| SP 203 | Effective Speaking | 3 |

Humanities and Social Science – 12 hrs.

| | | |
|---|---|---|
| ENG 153 | Introduction to Literature | 3 |
| | Humanities Elective (3) | 3 |
| | Social Science Elective (6) | 6 |

Mathematics and Science – 9 hrs.

| | | |
|---|---|---|
| MA 113 | College Algebra | 3 |
| | Or | |
| MA 133 | Quantitative Reasoning | 3 |
| | Science Elective (3) | 3 |
| | Math or Science Elective (3) | 3 |

Other – 12 hrs.

| | | |
|---|---|---|
| PSY 113 | Principles of Psychology | 3 |
| | General Education Electives (9) | 9 |

Additional Requirements - 78 hours

Required

| | | |
|---|---|---|
| UE 101 | University Experience | 1 |

Capstone and Internship – 3 hrs.

Internship will be arranged by the FSOE and based on student career objectives

| | | |
|---|---|---|
| EDU 4103 | Education Studies Internship | 3 |

Professional Education Requirements – 20 hrs.

Must complete at least 20 credit hours from any EDU courses.

Concentration Requirements - 30 hrs.

Must complete at least 15 credit hours in each of two minors.

Electives – 24 hrs.

Elective hours determined in conjunction with advisor and based on student career objectives.

| | | |
|---|---|---|
| | Free Electives (24) | 24 |

## Bachelor of Science Elementary Education (K–6) (120 hrs.)

To be eligible for licensure as an elementary teacher in grades K–6, the following program of study must be completed.

**Degree Requirements**

General Education Requirements - 33 hours

Communication – 9 hrs.

| | | |
|---|---|---|
| ENG 143 | College Composition | 3 |
| HUM 203 | Humanities Seminar | 3 |
| SP 203 | Effective Speaking | 3 |
| | Or | |
| COM 163 | Interpersonal Communication | 3 |

The Franks School of Education requires students earn a "C" or higher for ENG 143 and HUM 203 and SP 203 or COM 163.

Humanities and Social Science – 9 hrs.

| | | |
|---|---|---|
| ENG 153 | Introduction to Literature | 3 |
| PSY 113 | Principles of Psychology | 3 |
| HIS 103 | American History I | 3 |

The Franks School of Education requires students earn a "C" or higher for PSY 113.

Mathematics and Science – 11 hrs.

| | | |
|---|---|---|
| MA 184 | Mathematics for Elementary Teachers I | 4 |
| MA 194 | Mathematics for Elementary Teachers II | 4 |
| BIO 1003 | Plants and People (no lab) | 3 |

Other – 4 hrs.

| | | |
|---|---|---|
| PH 104 | Physical Science | 4 |

Additional Requirements - 87 hours

Required

| | | |
|---|---|---|
| UE 101 | University Experience | 1 |
| SOC 323 | The Family | 3 |
| GEO 323 | World Geography | 3 |
| POLS 113 | Introduction to Government | 3 |
| HIS 113 | American History II | 3 |

Professional Education Requirements – 60 hrs.

| | | |
|---|---|---|
| EDU 111 | Education Exploration | 1 |
| EDU 211 | Education Immersion | 1 |
| EDU 222 | Educational Psychology for the Elementary Teacher | 2 |
| EDU 252 | School & Community Health | 2 |

| | | |
|---|---|---|
| EDU 273 | Issues in American Education | 3 |
| EDU 301 | Instructional Design Clinical Experience | 1 |
| EDU 303 | Instructional Design | 3 |
| EDU 312 | Exceptional Learners | 2 |
| EDU 322 | Culturally Responsive Teaching | 2 |
| EDU 353 | Children's Literature | 3 |
| EDU 362 | Classroom Behavior & Environment | 2 |
| EDU 372 | Teaching of Literacy (3-6) | 2 |
| EDU 432 | Arts for the Elementary Teacher | 2 |
| EDU 441 | Teaching of Literacy Practicum | 1 |
| EDU 445 | Teaching of Literacy (K-2) | 5 |
| EDU 454 | Methods of Teaching Mathematics & Science | 4 |
| EDU 462 | Educational Measurement | 2 |
| EDU 463 | Educational Media And Technology | 3 |
| EDU 464 | Methods of Teaching Language Arts & Social Studies | 4 |
| EDU 470 | Supervised Student Teaching | 10 |
| EDU 482 | Student Teaching Seminar | 2 |
| EDU 450 | Elementary Methods Block Practicum | 0 |
| EDU 2113/EDU 2110 | Montessori E-I Cultural Geography Curriculum | 3 |

Electives – 14 hrs.

Elective hours determined in conjunction with advisor and based on student career objectives

| | | |
|---|---|---|
| | Electives (14) | 14 |

## Bachelor of Science Dual Licensure Elementary (K-6)/Montessori Elementary I

To be eligible for dual licensure as an elementary teacher (K-6) and Montessori Elementary I teacher, the following program of study must be completed.

**Degree Requirements**

General Education Requirements - 33 hrs.

Communication – 9 hrs.

| | | |
|---|---|---|
| ENG 143 | College Composition | 3 |
| HUM 203 | Humanities Seminar | 3 |
| SP 203 | Effective Speaking | 3 |
| | Or | |
| COM 163 | Interpersonal Communication | 3 |

Humanities and Social Science – 9 hrs.

| | | |
|---|---|---|
| ENG 153 | Introduction to Literature | 3 |
| PSY 113 | Principles of Psychology | 3 |
| HIS 103 | American History I | 3 |

Mathematics and Science – 11 hrs.

| | | |
|---|---|---|
| MA 184 | Mathematics for Elementary Teachers I | 4 |
| MA 194 | Mathematics for Elementary Teachers II | 4 |
| BIO 1003 | Plants and People (no lab) | 3 |

Other – 4 hrs.

| | | |
|---|---|---|
| PH 104 | Physical Science | 4 |

Additional Requirements - 102 hours

Required

| | | |
|---|---|---|
| UE 101 | University Experience | 1 |
| SOC 323 | The Family | 3 |
| GEO 323 | World Geography | 3 |
| POLS 113 | Introduction to Government | 3 |
| HIS 113 | American History II | 3 |

Professional Education Requirements - 60 hrs.

| | | |
|---|---|---|
| EDU 111 | Education Exploration | 1 |
| EDU 211 | Education Immersion | 1 |
| EDU 2113/EDU 2110 | Montessori E-I Cultural Geography Curriculum | 3 |
| EDU 222 | Educational Psychology for the Elementary Teacher | 2 |
| EDU 252 | School & Community Health | 2 |
| EDU 273 | Issues in American Education | 3 |
| EDU 301 | Instructional Design Clinical Experience | 1 |
| EDU 303 | Instructional Design | 3 |
| EDU 312 | Exceptional Learners | 2 |
| EDU 322 | Culturally Responsive Teaching | 2 |
| EDU 353 | Children's Literature | 3 |
| EDU 362 | Classroom Behavior & Environment | 2 |
| EDU 372 | Teaching of Literacy (3-6) | 2 |
| EDU 432 | Arts for the Elementary Teacher | 2 |
| EDU 441 | Teaching of Literacy Practicum | 1 |
| EDU 445 | Teaching of Literacy (K-2) | 5 |
| EDU 450 | Elementary Methods Block Practicum | 0 |
| EDU 454 | Methods of Teaching Mathematics & Science | 4 |
| EDU 462 | Educational Measurement | 2 |
| EDU 463 | Educational Media And Technology | 3 |
| EDU 464 | Methods of Teaching Language Arts & Social Studies | 4 |
| EDU 470 | Supervised Student Teaching | 10 |
| EDU 482 | Student Teaching Seminar | 2 |

Montessori Elementary I Requirements - 29 hrs.

| | | |
|---|---|---|
| EDU 1001 | Montessori Exploration (EL 1) | 1 |
| EDU 1103/EDU 1100 | Montessori E-I EC Overview | 3 |
| EDU 1113/EDU 1110 | Montessori E-I Philosophy/Child Development | 3 |
| EDU 2103/EDU 2100 | Montessori E-I Mathematics Curriculum | 3 |
| EDU 3101/EDU 3100 | Montessori E-I Geometry Curriculum I | 1 |
| EDU 3113/EDU 3110 | Montessori E-I Language Curriculum | 3 |
| EDU 3131/EDU 3130 | Montessori E-I Geometry Curriculum II | 1 |
| EDU 4101 | Montessori E-I Curriculum Design/Classroom Leadership I | 1 |
| EDU 4112/EDU 4110 | Montessori E-I Practical Life Curriculum | 2 |
| EDU 4123/EDU 4120 | Montessori E-I Practicum Teaching I | 3 |
| EDU 4132/EDU 4130 | Montessori E-I Practicum Seminar I | 2 |
| EDU 4143/EDU 4140 | Montessori E-I Practicum Teaching II | 3 |

| | | |
|---|---|---|
| EDU 4152/EDU 4150 | Montessori E-I Practicum Seminar II | 2 |
| EDU 4161/EDU 4160 | Montessori E-I Curriculum Design/Classroom Leadership II | 1 |

# Bachelor of Science Dual Licensure Elementary Education (K–6)/Special Education Mild Intervention (P-12) (120 hrs.)

To be eligible for dual licensure as an elementary teacher/special education teacher in grades K–6, the following program of study must be completed.

**Degree Requirements**

General Education Requirements - 33 hours

Communication – 9 hrs.

| | | |
|---|---|---|
| ENG 143 | College Composition | 3 |
| HUM 203 | Humanities Seminar | 3 |
| SP 203 | Effective Speaking | 3 |
| | Or | |
| COM 163 | Interpersonal Communication | 3 |

The Franks School of Education requires students earn a “C” or higher for ENG 143 and HUM 203 and SP 203 or COM 163.

Humanities and Social Science – 9 hrs.

| | | |
|---|---|---|
| ENG 153 | Introduction to Literature | 3 |
| PSY 113 | Principles of Psychology | 3 |
| HIS 103 | American History I | 3 |

The Franks School of Education requires students earn a “C” or higher for PSY 113.

Mathematics and Science – 11 hrs.

| | | |
|---|---|---|
| MA 184 | Mathematics for Elementary Teachers I | 4 |
| MA 194 | Mathematics for Elementary Teachers II | 4 |
| BIO 1003 | Plants and People (no lab) | 3 |

Other – 4 hrs.

| | | |
|---|---|---|
| PH 104 | Physical Science | 4 |

Additional Requirements - 87 hours

Required

| | | |
|---|---|---|
| UE 101 | University Experience | 1 |
| SOC 323 | The Family | 3 |
| GEO 323 | World Geography | 3 |
| POLS 113 | Introduction to Government | 3 |
| HIS 113 | American History II | 3 |

Professional Education Requirements – 58 hrs.

| | | |
|---|---|---|
| EDU 111 | Education Exploration | 1 |
| EDU 211 | Education Immersion | 1 |
| EDU 222 | Educational Psychology for the Elementary Teacher | 2 |
| EDU 252 | School & Community Health | 2 |
| EDU 273 | Issues in American Education | 3 |

| | | |
|---|---|---|
| EDU 301 | Instructional Design Clinical Experience | 1 |
| EDU 303 | Instructional Design | 3 |
| EDU 322 | Culturally Responsive Teaching | 2 |
| EDU 353 | Children's Literature | 3 |
| EDU 362 | Classroom Behavior & Environment | 2 |
| EDU 372 | Teaching of Literacy (3-6) | 2 |
| EDU 432 | Arts for the Elementary Teacher | 2 |
| EDU 441 | Teaching of Literacy Practicum | 1 |
| EDU 445 | Teaching of Literacy (K-2) | 5 |
| EDU 450 | Elementary Methods Block Practicum | 0 |
| EDU 454 | Methods of Teaching Mathematics & Science | 4 |
| EDU 462 | Educational Measurement | 2 |
| EDU 463 | Educational Media And Technology | 3 |
| EDU 464 | Methods of Teaching Language Arts & Social Studies | 4 |
| EDU 470 | Supervised Student Teaching | 10 |
| EDU 482 | Student Teaching Seminar | 2 |
| EDU 2113/EDU 2110 | Montessori E-I Cultural Geography Curriculum | 3 |

Special Education Mild Intervention (P-12) – 12 hrs.

| | | |
|---|---|---|
| EDU 181 | Introduction to Teaching Students with Mild Exceptional Needs | 1 |
| EDU 282 | The Development of Students with Mild Except Needs | 2 |
| EDU 382 | Behavioral Analysis of Students with Mild Exceptional Needs | 2 |
| EDU 483 | Individualized Planning & Assessment of Students with Mild Exceptional Needs | 3 |
| EDU 480 | Special Education Methods Practicum | 0 |
| EDU 484 | Methods of Teaching Students with Mild Exceptional Needs | 4 |

Electives - 4 hrs

| | | |
|---|---|---|
| | Free Electives (4) | 4 |

## Bachelor of Science - English/Language Arts Education (5–12) (120 hrs.)

To be eligible for licensure as an English/Language Arts teacher in grades 5-12, the following program of study must be completed.

**Degree Requirements**

General Education Requirements - 30 hours

Communication – 12 hrs.

| | | |
|---|---|---|
| ENG 143 | College Composition | 3 |
| HUM 203 | Humanities Seminar | 3 |
| SP 203 | Effective Speaking | 3 |
| COM 163 | Interpersonal Communication | 3 |

The Franks School of Education requires students earn a “C” or higher for ENG 143 and HUM 203 and SP 203 or COM 163.

Humanities and Social Science – 9 hrs.

| | | |
|---|---|---|
| ENG 153 | Introduction to Literature | 3 |

| | | |
|---|---|---|
| PSY 113 | Principles of Psychology | 3 |
| FLM 203 | Film Appreciation | 3 |

The Franks School of Education requires students earn a “C” or higher for PSY 113.

Mathematics and Science – 9 hrs.

| | | |
|---|---|---|
| MA 113 | College Algebra | 3 |
| | Or | |
| | Higher Math | |
| | Science Elective (3) | 3 |
| | Math or Science Elective (3) | 3 |

Additional Requirements - 90 hours

Required

| | | |
|---|---|---|
| UE 101 | University Experience | 1 |

English/Language Arts Content Area – 43 hrs.

Content Requirements – 9 hours

| | | |
|---|---|---|
| ENG 233 | Mythology | 3 |
| ENG 273 | Creative Writing | 3 |
| ENG 433 | Shakespeare & His Times | 3 |

English Language – 3 hours

| | | |
|---|---|---|
| ENG 363 | The English Language | 3 |

Writing and Composition – 13 hours

| | | |
|---|---|---|
| ENG 133 | Technical Communication | 3 |
| ENG 303 | Advanced Technical Communication | 3 |
| | Or | |
| ENG 453 | Advanced Composition | 3 |
| ENG 412 | Writing Center Consulting | 2 |
| ENG 411 | Writing Center Consulting Laboratory | 1 |
| COM 183 | Writing For The Media | 3 |

ENG 411: taken twice

Literature Surveys – 9 hours (take 3)

| | | |
|---|---|---|
| ENG 2013 | British Literature I | 3 |
| ENG 2023 | British Literature II | 3 |
| ENG 2113 | American Literature I | 3 |
| ENG 2123 | American Literature II | 3 |
| ENG 253 | World Literature | 3 |

Literature Electives – 9 hours (take 3)*

| | | |
|---|---|---|
| ENG 263 | Contemporary Themes in Literature | 3 |
| ENG 3303 | The Bible as Literature | 3 |
| ENG 423 | Drama | 3 |
| ENG 443 | Poetry | 3 |

*Or upper division literature course as approved by advisor

Professional Education Requirements – 45 hrs.

| | | |
|---|---|---|
| EDU 111 | Education Exploration | 1 |
| EDU 211 | Education Immersion | 1 |
| EDU 232 | Educational Psychology for the Middle & Secondary School Teacher | 2 |
| EDU 273 | Issues in American Education | 3 |
| EDU 301 | Instructional Design Clinical Experience | 1 |
| EDU 303 | Instructional Design | 3 |
| EDU 312 | Exceptional Learners | 2 |
| EDU 322 | Culturally Responsive Teaching | 2 |
| EDU 331 | Literacy in the Content Area Clinical Experience | 1 |
| EDU 332 | Literacy in the Content Area | 2 |
| EDU 362 | Classroom Behavior & Environment | 2 |
| EDU 411 | Practicum in Teaching - Middle School | 1 |
| EDU 412 | The Middle School | 2 |
| EDU 422 | Middle School Methods | 2 |
| EDU 431 | Secondary Methods Practicum | 1 |
| EDU 442 | Secondary Methods | 2 |
| EDU 462 | Educational Measurement | 2 |
| EDU 463 | Educational Media And Technology | 3 |
| EDU 470 | Supervised Student Teaching | 10 |
| EDU 482 | Student Teaching Seminar | 2 |

Electives – 1 hrs.

Elective hours determined in conjunction with advisor and based on student career objectives

| | | |
|---|---|---|
| | Free Electives (1) | 1 |

## Bachelor of Science English/Language Arts Education (5-12) and Special Education Mild Intervention (P–12) (127 hrs.)

To be eligible for licensure as an English/Language Arts teacher in grades 5-12 and Special Education for Mild Interventions in grades P-12, the following program of study must be completed.

**Degree Requirements**

General Education Requirements - 30 hours

Communication – 12 hrs.

| | | |
|---|---|---|
| ENG 143 | College Composition | 3 |
| HUM 203 | Humanities Seminar | 3 |
| SP 203 | Effective Speaking | 3 |
| COM 163 | Interpersonal Communication | 3 |

The Franks School of Education requires students earn a “C” or higher for ENG 143 and HUM 203 and SP 203 or COM 163.

Humanities and Social Science – 9 hrs.

| | | |
|---|---|---|
| ENG 153 | Introduction to Literature | 3 |
| PSY 113 | Principles of Psychology | 3 |
| FLM 203 | Film Appreciation | 3 |

The Franks School of Education requires students earn a “C” or higher for PSY 113.

Mathematics and Science – 9 hrs.

| | | |
|---|---|---|
| MA 113 | College Algebra | 3 |
| | Or | |
| | Higher Math | |
| | Science Elective (3) | 3 |
| | Math or Science Elective (3) | 3 |

Additional Requirements - 97 hours

Required

| | | |
|---|---|---|
| UE 101 | University Experience | 1 |

English/Language Arts Content Area – 43 hrs.

Content Requirements – 9 hours

| | | |
|---|---|---|
| ENG 233 | Mythology | 3 |
| ENG 273 | Creative Writing | 3 |
| ENG 433 | Shakespeare & His Times | 3 |

English Language – 3 hours

| | | |
|---|---|---|
| ENG 363 | The English Language | 3 |

Writing and Composition – 13 hours

| | | |
|---|---|---|
| ENG 133 | Technical Communication | 3 |
| ENG 303 | Advanced Technical Communication | 3 |
| | Or | |
| ENG 453 | Advanced Composition | 3 |
| ENG 412 | Writing Center Consulting | 2 |
| ENG 411 | Writing Center Consulting Laboratory | 1 |
| COM 183 | Writing For The Media | 3 |

ENG 411: taken twice

Literature Surveys – 9 hours (take 3)

| | | |
|---|---|---|
| ENG 2013 | British Literature I | 3 |
| ENG 2023 | British Literature II | 3 |
| ENG 2113 | American Literature I | 3 |
| ENG 2123 | American Literature II | 3 |
| ENG 253 | World Literature | 3 |

Literature Electives – 9 hours (take 3)*

| | | |
|---|---|---|
| ENG 263 | Contemporary Themes in Literature | 3 |
| ENG 3303 | The Bible as Literature | 3 |
| ENG 423 | Drama | 3 |
| ENG 443 | Poetry | 3 |

*Or upper division literature course as approved by advisor

Professional Education Requirements – 44 hrs.

| | | |
|---|---|---|
| EDU 111 | Education Exploration | 1 |
| EDU 211 | Education Immersion | 1 |
| EDU 232 | Educational Psychology for the Middle & Secondary School Teacher | 2 |

| | | |
|---|---|---|
| EDU 273 | Issues in American Education | 3 |
| EDU 301 | Instructional Design Clinical Experience | 1 |
| EDU 303 | Instructional Design | 3 |
| EDU 322 | Culturally Responsive Teaching | 2 |
| EDU 331 | Literacy in the Content Area Clinical Experience | 1 |
| EDU 332 | Literacy in the Content Area | 2 |
| EDU 362 | Classroom Behavior & Environment | 2 |
| EDU 411 | Practicum in Teaching - Middle School | 1 |
| EDU 412 | The Middle School | 2 |
| EDU 422 | Middle School Methods | 2 |
| EDU 431 | Secondary Methods Practicum | 1 |
| EDU 442 | Secondary Methods | 2 |
| EDU 462 | Educational Measurement | 2 |
| EDU 463 | Educational Media And Technology | 3 |
| EDU 470 | Supervised Student Teaching | 10 |
| EDU 482 | Student Teaching Seminar | 2 |

Special Education Mild Intervention (P-12) – 12 hrs.

| | | |
|---|---|---|
| EDU 181 | Introduction to Teaching Students with Mild Exceptional Needs | 1 |
| EDU 282 | The Development of Students with Mild Except Needs | 2 |
| EDU 382 | Behavioral Analysis of Students with Mild Exceptional Needs | 2 |
| EDU 480 | Special Education Methods Practicum | 0 |
| EDU 483 | Individualized Planning & Assessment of Students with Mild Exceptional Needs | 3 |
| EDU 484 | Methods of Teaching Students with Mild Exceptional Needs | 4 |

## Bachelor of Science Health/Physical Education (P–12) (120 hrs.)

To be eligible for licensure as a health and/or physical education teacher in grades P-12, the following program of study must be completed.

**Degree Requirements**

General Education Requirements - 30 hours

Communication – 9 hrs.

| | | |
|---|---|---|
| ENG 143 | College Composition | 3 |
| HUM 203 | Humanities Seminar | 3 |
| SP 203 | Effective Speaking | 3 |
| | Or | |
| COM 163 | Interpersonal Communication | 3 |

The Franks School of Education requires students earn a “C” or higher for ENG 143 and HUM 203 and SP 203 or COM 163.

Humanities and Social Science – 9 hrs.

| | | |
|---|---|---|
| ENG 153 | Introduction to Literature | 3 |
| PSY 113 | Principles of Psychology | 3 |
| EDU 273 | Issues in American Education | 3 |

The Franks School of Education requires students earn a “C” or higher for PSY 113.

Mathematics and Science – 10 hrs.

| | | |
|---|---|---|
| MA 113 | College Algebra<br>Or<br>Higher Math | 3 |
| BIO 1003 | Plants and People (no lab) | 3 |
| BIO 154 | Human Body Systems | 4 |

Other – 2 hrs.

| | | |
|---|---|---|
| EXS 102 | Lifetime Wellness | 2 |

Additional Requirements - 90 hours

Required

| | | |
|---|---|---|
| UE 101 | University Experience | 1 |

Health and Physical Education Content Area – 39 hrs.

| | | |
|---|---|---|
| BIO 163 | Medical Terminology | 3 |
| EXS 103 | Teaching Sport Skills I | 3 |
| EXS 243 | Athletic Training | 3 |
| EXS 263 | Motor Learning | 3 |
| EXS 273 | Nutrition | 3 |
| EXS 293 | Biomechanics | 3 |
| EXS 333 | Kinesiology | 3 |
| EXS 373/AHS 373 | Health Promotion & Problems | 3 |
| EXS 383/AHS 383 | Health Coaching | 3 |
| EXS 483 | Professional Development in Exercise Science | 3 |
| EXS 493 | Strength and Conditioning Preparation | 3 |
| SM 133 | Contemporary Issues in Sport | 3 |
| MGT 303 | Risk Management<br>Or | 3 |
| EXS 203 | Risk and Sports | 3 |

Professional Education Requirements – 46 hrs.

| | | |
|---|---|---|
| EDU 111 | Education Exploration | 1 |
| EDU 211 | Education Immersion | 1 |
| EDU 222 | Educational Psychology for the Elementary Teacher | 2 |
| EDU 232 | Educational Psychology for the Middle & Secondary School Teacher | 2 |
| EDU 252 | School & Community Health | 2 |
| EDU 301 | Instructional Design Clinical Experience | 1 |
| EDU 303 | Instructional Design | 3 |
| EDU 312 | Exceptional Learners | 2 |
| EDU 322 | Culturally Responsive Teaching | 2 |
| EDU 331 | Literacy in the Content Area Clinical Experience | 1 |
| EDU 332 | Literacy in the Content Area | 2 |
| EDU 362 | Classroom Behavior & Environment | 2 |
| EDU 411 | Practicum in Teaching - Middle School | 1 |
| EDU 412 | The Middle School | 2 |

| | | |
|---|---|---|
| EDU 422 | Middle School Methods | 2 |
| EDU 431 | Secondary Methods Practicum | 1 |
| EDU 442 | Secondary Methods | 2 |
| EDU 462 | Educational Measurement | 2 |
| EDU 463 | Educational Media And Technology | 3 |
| EDU 470 | Supervised Student Teaching | 10 |
| EDU 482 | Student Teaching Seminar | 2 |

Electives – 4 hrs.

Elective hours determined in conjunction with advisor and based on student career objectives

| | | |
|---|---|---|
| | Free Electives (4) | 4 |

## Bachelor of Science Health/Physical Education (P–12) and Special Education Mild Interventions (P-12) (123 hrs.)

To be eligible for licensure as a health and/or physical education teacher in grades P-12, and Special Education for Mild Intervention in grades P-12, the following program of study must be completed.

**Degree Requirements**

General Education Requirements - 30 hours

Communication – 9 hrs.

| | | |
|---|---|---|
| ENG 143 | College Composition | 3 |
| HUM 203 | Humanities Seminar | 3 |
| SP 203 | Effective Speaking | 3 |
| | Or | |
| COM 163 | Interpersonal Communication | 3 |

The Franks School of Education requires students earn a “C” or higher for ENG 143 and HUM 203 and SP 203 or COM 163.

Humanities and Social Science – 9 hrs.

| | | |
|---|---|---|
| ENG 153 | Introduction to Literature | 3 |
| PSY 113 | Principles of Psychology | 3 |
| EDU 273 | Issues in American Education | 3 |

The Franks School of Education requires students earn a “C” or higher for PSY 113.

Mathematics and Science – 10 hrs.

| | | |
|---|---|---|
| MA 113 | College Algebra | 3 |
| | Or | |
| | Higher Math | |
| BIO 1003 | Plants and People (no lab) | 3 |
| BIO 154 | Human Body Systems | 4 |

Other – 2 hrs.

| | | |
|---|---|---|
| EXS 102 | Lifetime Wellness | 2 |

Additional Requirements - 93 hours

Required

| | | |
|---|---|---|
| UE 101 | University Experience | 1 |

Health and Physical Education Content Area – 39 hrs.

| | | |
|---|---|---|
| BIO 163 | Medical Terminology | 3 |
| EXS 103 | Teaching Sport Skills I | 3 |
| EXS 243 | Athletic Training | 3 |
| EXS 263 | Motor Learning | 3 |
| EXS 273 | Nutrition | 3 |
| EXS 293 | Biomechanics | 3 |
| EXS 333 | Kinesiology | 3 |
| EXS 373/AHS 373 | Health Promotion & Problems | 3 |
| EXS 383/AHS 383 | Health Coaching | 3 |
| EXS 483 | Professional Development in Exercise Science | 3 |
| EXS 493 | Strength and Conditioning Preparation | 3 |
| SM 133 | Contemporary Issues in Sport | 3 |
| MGT 303 | Risk Management | 3 |
| | Or | |
| EXS 203 | Risk and Sports | 3 |

Professional Education Requirements – 41 hrs.

| | | |
|---|---|---|
| EDU 111 | Education Exploration | 1 |
| EDU 211 | Education Immersion | 1 |
| EDU 222 | Educational Psychology for the Elementary Teacher | 2 |
| EDU 232 | Educational Psychology for the Middle & Secondary School Teacher | 2 |
| EDU 252 | School & Community Health | 2 |
| EDU 301 | Instructional Design Clinical Experience | 1 |
| EDU 303 | Instructional Design | 3 |
| EDU 322 | Culturally Responsive Teaching | 2 |
| EDU 331 | Literacy in the Content Area Clinical Experience | 1 |
| EDU 332 | Literacy in the Content Area | 2 |
| EDU 362 | Classroom Behavior & Environment | 2 |
| EDU 411 | Practicum in Teaching - Middle School | 1 |
| EDU 412 | The Middle School | 2 |
| EDU 422 | Middle School Methods | 2 |
| EDU 431 | Secondary Methods Practicum | 1 |
| EDU 442 | Secondary Methods | 2 |
| EDU 462 | Educational Measurement | 2 |
| EDU 470 | Supervised Student Teaching | 10 |
| EDU 482 | Student Teaching Seminar | 2 |

Special Education Mild Intervention (P-12) – 12 hrs.

| | | |
|---|---|---|
| EDU 181 | Introduction to Teaching Students with Mild Exceptional Needs | 1 |
| EDU 282 | The Development of Students with Mild Except Needs | 2 |
| EDU 382 | Behavioral Analysis of Students with Mild Exceptional Needs | 2 |
| EDU 480 | Special Education Methods Practicum | 0 |
| EDU 483 | Individualized Planning & Assessment of Students with Mild Exceptional Needs | 3 |
| EDU 484 | Methods of Teaching Students with Mild | 4 |

Exceptional Needs

## Bachelor of Science - Life Sciences (Biology) Education (5-12) (120 hrs.)

To be eligible for licensure as a life sciences (biology) teacher in grades 5-12, the following program of study must be completed.

**Degree Requirements**

General Education Requirements - 32-33 hours

Communication – 9 hrs.

| | | |
|---|---|---|
| ENG 143 | College Composition | 3 |
| HUM 203 | Humanities Seminar | 3 |
| SP 203 | Effective Speaking | 3 |
| | Or | |
| COM 163 | Interpersonal Communication | 3 |

The Franks School of Education requires students earn a "C" or higher for ENG 143 and HUM 203 and SP 203 or COM 163.

Humanities and Social Science – 9 hrs.

| | | |
|---|---|---|
| ENG 153 | Introduction to Literature | 3 |
| PSY 113 | Principles of Psychology | 3 |
| EDU 273 | Issues in American Education | 3 |

The Franks School of Education requires students earn a "C" or higher for PSY 113.

Mathematics and Science – 14 hrs.

| | | |
|---|---|---|
| MA 113 | College Algebra | 3 |
| MA 123 | Trigonometry | 3 |
| | Or | |
| MA 134 | Calculus I | 4 |
| CH 104 | General Chemistry I | 4 |
| CH 114 | General Chemistry II | 4 |

Additional Requirements - 87-88 hours

Required

| | | |
|---|---|---|
| UE 101 | University Experience | 1 |

Biology Content Area – 35 hrs.

| | | |
|---|---|---|
| BIO 114 | Principles of Biology I | 4 |
| BIO 124 | Principles of Biology II | 4 |
| BIO 154 | Human Body Systems | 4 |
| BIO 304 | Plant Biology | 4 |
| BIO 314 | Animal Biology | 4 |
| BIO 324 | Microbiology | 4 |
| BIO 334 | Environmental Biology | 4 |
| BIO 233 | Cell Biology | 3 |
| BIO 414 | Genetics | 4 |

Professional Education Requirements – 42 hrs.

| | | |
|---|---|---|
| EDU 111 | Education Exploration | 1 |

| | | |
|---|---|---|
| EDU 211 | Education Immersion | 1 |
| EDU 232 | Educational Psychology for the Middle & Secondary School Teacher | 2 |
| EDU 301 | Instructional Design Clinical Experience | 1 |
| EDU 303 | Instructional Design | 3 |
| EDU 312 | Exceptional Learners | 2 |
| EDU 322 | Culturally Responsive Teaching | 2 |
| EDU 331 | Literacy in the Content Area Clinical Experience | 1 |
| EDU 332 | Literacy in the Content Area | 2 |
| EDU 362 | Classroom Behavior & Environment | 2 |
| EDU 431 | Secondary Methods Practicum | 1 |
| EDU 442 | Secondary Methods | 2 |
| EDU 462 | Educational Measurement | 2 |
| EDU 411 | Practicum in Teaching - Middle School | 1 |
| EDU 412 | The Middle School | 2 |
| EDU 422 | Middle School Methods | 2 |
| EDU 463 | Educational Media And Technology | 3 |
| EDU 470 | Supervised Student Teaching | 10 |
| EDU 482 | Student Teaching Seminar | 2 |

Electives – 9-10 hrs.

Elective hours determined in conjunction with advisor and based on student career objectives

| | | |
|---|---|---|
| | Free Electives (9-10) | 9-10 |

## Bachelor of Science - Life Sciences (Biology) Education (5-12) and Special Education Mild Interventions (P-12) (120 hrs.)

To be eligible for licensure as a life sciences (biology) teacher in grades 5-12 and Special Education for Mild Interventions in grades P-12, the following program of study must be completed.

**Degree Requirements**

General Education Requirements - 32-33 hours

Communication – 9 hrs.

| | | |
|---|---|---|
| ENG 143 | College Composition | 3 |
| HUM 203 | Humanities Seminar | 3 |
| SP 203 | Effective Speaking | 3 |
| | Or | |
| COM 163 | Interpersonal Communication | 3 |

The Franks School of Education requires students earn a “C” or higher for ENG 143 and HUM 203 and SP 203 or COM 163.

Humanities and Social Science – 9 hrs.

| | | |
|---|---|---|
| ENG 153 | Introduction to Literature | 3 |
| PSY 113 | Principles of Psychology | 3 |
| EDU 273 | Issues in American Education | 3 |

The Franks School of Education requires students earn a “C” or higher for PSY 113.

Mathematics and Science – 14 hrs.

| | | |
|---|---|---|
| MA 113 | College Algebra | 3 |

| | | |
|---|---|---|
| MA 123 | Trigonometry | 3 |
| | Or | |
| MA 134 | Calculus I | 4 |
| | | |
| CH 104 | General Chemistry I | 4 |
| CH 114 | General Chemistry II | 4 |

Additional Requirements - 88 hours

Required

| | | |
|---|---|---|
| UE 101 | University Experience | 1 |

Biology Content Area – 35 hrs.

| | | |
|---|---|---|
| BIO 114 | Principles of Biology I | 4 |
| BIO 124 | Principles of Biology II | 4 |
| BIO 154 | Human Body Systems | 4 |
| BIO 304 | Plant Biology | 4 |
| BIO 314 | Animal Biology | 4 |
| BIO 324 | Microbiology | 4 |
| BIO 334 | Environmental Biology | 4 |
| BIO 233 | Cell Biology | 3 |
| BIO 414 | Genetics | 4 |

Professional Education Requirements – 40 hrs.

| | | |
|---|---|---|
| EDU 111 | Education Exploration | 1 |
| EDU 211 | Education Immersion | 1 |
| EDU 232 | Educational Psychology for the Middle & Secondary School Teacher | 2 |
| EDU 301 | Instructional Design Clinical Experience | 1 |
| EDU 303 | Instructional Design | 3 |
| EDU 322 | Culturally Responsive Teaching | 2 |
| EDU 331 | Literacy in the Content Area Clinical Experience | 1 |
| EDU 332 | Literacy in the Content Area | 2 |
| EDU 362 | Classroom Behavior & Environment | 2 |
| EDU 431 | Secondary Methods Practicum | 1 |
| EDU 442 | Secondary Methods | 2 |
| EDU 462 | Educational Measurement | 2 |
| EDU 411 | Practicum in Teaching - Middle School | 1 |
| EDU 412 | The Middle School | 2 |
| EDU 422 | Middle School Methods | 2 |
| EDU 463 | Educational Media And Technology | 3 |
| EDU 470 | Supervised Student Teaching | 10 |
| EDU 482 | Student Teaching Seminar | 2 |

Special Education Mild Intervention (P-12) – 12 hrs.

| | | |
|---|---|---|
| EDU 181 | Introduction to Teaching Students with Mild Exceptional Needs | 1 |
| EDU 282 | The Development of Students with Mild Except Needs | 2 |
| EDU 382 | Behavioral Analysis of Students with Mild Exceptional Needs | 2 |
| EDU 480 | Special Education Methods Practicum | 0 |

| | | |
|---|---|---|
| EDU 483 | Individualized Planning & Assessment of Students with Mild Exceptional Needs | 3 |
| EDU 484 | Methods of Teaching Students with Mild Exceptional Needs | 4 |

# Bachelor of Science - Mathematics Education (5-12) (120 hrs.)

To be eligible for licensure as a mathematics teacher in grades 5-12, the following program of study must be completed.

**Degree Requirements**

General Education Requirements - 30 hours

Communication – 9 hrs.

| | | |
|---|---|---|
| ENG 143 | College Composition | 3 |
| HUM 203 | Humanities Seminar | 3 |
| SP 203 | Effective Speaking | 3 |
| | Or | |
| COM 163 | Interpersonal Communication | 3 |

The Franks School of Education requires students earn a “C” or higher for ENG 143 and HUM 203 and SP 203 or COM 163.

Humanities and Social Science – 9 hrs.

| | | |
|---|---|---|
| ENG 153 | Introduction to Literature | 3 |
| PSY 113 | Principles of Psychology | 3 |
| EDU 273 | Issues in American Education | 3 |

The Franks School of Education requires students earn a “C” or higher for PSY 113.

Mathematics and Science – 9 hrs.

| | | |
|---|---|---|
| MA 134 | Calculus I | 4 |
| | Science Elective (3) | 3 |
| | Math or Science Elective (2) | 2 |

Other – 3 hrs.

| | | |
|---|---|---|
| EDU 463 | Educational Media And Technology | 3 |

Additional Requirements - 90 hours

Required

| | | |
|---|---|---|
| UE 101 | University Experience | 1 |

Mathematics Content Area – 28 hrs.

| | | |
|---|---|---|
| MA 164 | Calculus II | 4 |
| MA 213 | Calculus III | 3 |
| MA 233 | Differential Equations | 3 |
| MA 303 | College Geometry | 3 |
| MA 313 | Introduction to Linear Algebra | 3 |
| MA 343 | Introduction to Proofs | 3 |
| MA 4013 | Abstract Algebra | 3 |
| MA 393 | Probability & Statistics | 3 |
| MA 473 | Graph Theory & Combinatorics | 3 |

Professional Education Requirements – 39 hrs.

| | | |
|---|---|---|
| EDU 111 | Education Exploration | 1 |

| | | |
|---|---|---|
| EDU 211 | Education Immersion | 1 |
| EDU 232 | Educational Psychology for the Middle & Secondary School Teacher | 2 |
| EDU 301 | Instructional Design Clinical Experience | 1 |
| EDU 303 | Instructional Design | 3 |
| EDU 312 | Exceptional Learners | 2 |
| EDU 322 | Culturally Responsive Teaching | 2 |
| EDU 331 | Literacy in the Content Area Clinical Experience | 1 |
| EDU 332 | Literacy in the Content Area | 2 |
| EDU 362 | Classroom Behavior & Environment | 2 |
| EDU 431 | Secondary Methods Practicum | 1 |
| EDU 442 | Secondary Methods | 2 |
| EDU 462 | Educational Measurement | 2 |
| EDU 411 | Practicum in Teaching - Middle School | 1 |
| EDU 412 | The Middle School | 2 |
| EDU 422 | Middle School Methods | 2 |
| EDU 470 | Supervised Student Teaching | 10 |
| EDU 482 | Student Teaching Seminar | 2 |

Electives – 22 hrs.

Elective hours determined in conjunction with advisor and based on student career objectives

| | | |
|---|---|---|
| | Free Electives (22) | 22 |

## Bachelor of Science - Mathematics Education (5-12) and Special Education Mild Interventions (P-12) (120 hrs.)

To be eligible for licensure as a mathematics teacher in grades 5-12 and Special Education for Mild Interventions in grades P-12, the following program of study must be completed.

**Degree Requirements**

General Education Requirements - 30 hours

Communication – 9 hrs.

| | | |
|---|---|---|
| ENG 143 | College Composition | 3 |
| HUM 203 | Humanities Seminar | 3 |
| SP 203 | Effective Speaking | 3 |
| | Or | |
| COM 163 | Interpersonal Communication | 3 |

The Franks School of Education requires students earn a “C” or higher for ENG 143 and HUM 203 and SP 203 or COM 163.

Humanities and Social Science – 9 hrs.

| | | |
|---|---|---|
| ENG 153 | Introduction to Literature | 3 |
| PSY 113 | Principles of Psychology | 3 |
| EDU 273 | Issues in American Education | 3 |

The Franks School of Education requires students earn a “C” or higher for PSY 113.

Mathematics and Science – 9 hrs.

| | | |
|---|---|---|
| MA 134 | Calculus I | 4 |
| | Science Elective (3) | 3 |

| | | |
|---|---|---|
| | Math or Science Elective (2) | 2 |

Other – 3 hrs.

| | | |
|---|---|---|
| EDU 463 | Educational Media And Technology | 3 |

Additional Requirements - 90 hours

Required

| | | |
|---|---|---|
| UE 101 | University Experience | 1 |

Mathematics Content Area – 28 hrs.

| | | |
|---|---|---|
| MA 164 | Calculus II | 4 |
| MA 213 | Calculus III | 3 |
| MA 233 | Differential Equations | 3 |
| MA 303 | College Geometry | 3 |
| MA 313 | Introduction to Linear Algebra | 3 |
| MA 343 | Introduction to Proofs | 3 |
| MA 4013 | Abstract Algebra | 3 |
| MA 393 | Probability & Statistics | 3 |
| MA 473 | Graph Theory & Combinatorics | 3 |

Professional Education Requirements – 37 hrs.

| | | |
|---|---|---|
| EDU 111 | Education Exploration | 1 |
| EDU 211 | Education Immersion | 1 |
| EDU 232 | Educational Psychology for the Middle & Secondary School Teacher | 2 |
| EDU 301 | Instructional Design Clinical Experience | 1 |
| EDU 303 | Instructional Design | 3 |
| EDU 322 | Culturally Responsive Teaching | 2 |
| EDU 331 | Literacy in the Content Area Clinical Experience | 1 |
| EDU 332 | Literacy in the Content Area | 2 |
| EDU 362 | Classroom Behavior & Environment | 2 |
| EDU 431 | Secondary Methods Practicum | 1 |
| EDU 442 | Secondary Methods | 2 |
| EDU 462 | Educational Measurement | 2 |
| EDU 411 | Practicum in Teaching - Middle School | 1 |
| EDU 412 | The Middle School | 2 |
| EDU 422 | Middle School Methods | 2 |
| EDU 470 | Supervised Student Teaching | 10 |
| EDU 482 | Student Teaching Seminar | 2 |

Electives – 12 hrs.

Elective hours determined in conjunction with advisor and based on student career objectives

| | | |
|---|---|---|
| | Free Electives (12) | 12 |

Special Education Mild Intervention (P-12) – 12 hrs.

| | | |
|---|---|---|
| EDU 181 | Introduction to Teaching Students with Mild Exceptional Needs | 1 |
| EDU 282 | The Development of Students with Mild Except Needs | 2 |
| EDU 382 | Behavioral Analysis of Students with Mild Exceptional Needs | 2 |
| EDU 480 | Special Education Methods Practicum | 0 |

| | | |
|---|---|---|
| EDU 483 | Individualized Planning & Assessment of Students with Mild Exceptional Needs | 3 |
| EDU 484 | Methods of Teaching Students with Mild Exceptional Needs | 4 |

## Bachelor of Science - Science Education/Chemistry (5-12) (120 hrs.)

To be eligible for licensure as a chemistry teacher in grades 5–12, the following program of study must be completed.

**Degree Requirements**

General Education Requirements - 30 hours

Communication – 9 hrs.

| | | |
|---|---|---|
| ENG 143 | College Composition | 3 |
| HUM 203 | Humanities Seminar | 3 |
| SP 203 | Effective Speaking | 3 |
| | Or | |
| COM 163 | Interpersonal Communication | 3 |

The Franks School of Education requires students earn a “C” or higher for ENG 143 and HUM 203 and SP 203 or COM 163.

Humanities and Social Science – 9 hrs.

| | | |
|---|---|---|
| ENG 153 | Introduction to Literature | 3 |
| PSY 113 | Principles of Psychology | 3 |
| EDU 273 | Issues in American Education | 3 |

The Franks School of Education requires students earn a “C” or higher for PSY 113.

Mathematics and Science – 12 hrs.

| | | |
|---|---|---|
| MA 134 | Calculus I | 4 |
| MA 164 | Calculus II | 4 |
| PH 224 | University Physics I | 4 |

Additional Requirements - 90 hours

Required

| | | |
|---|---|---|
| UE 101 | University Experience | 1 |

Chemistry Content Area – 39 hrs.

| | | |
|---|---|---|
| CH 104 | General Chemistry I | 4 |
| CH 114 | General Chemistry II | 4 |
| CH 204 | Organic Chemistry I | 4 |
| CH 234 | Quantitative Chemical Analysis | 4 |
| CH 344 | Inorganic Chemistry | 4 |
| CH 324 | Chemical Instrumental Analysis | 4 |
| CH 354 | Physical Chemistry I | 4 |
| CH 434 | Biochemistry I | 4 |
| MA 213 | Calculus III | 3 |
| BIO 114 | Principles of Biology I | 4 |

Professional Education Requirements – 42 hrs.

| | | |
|---|---|---|
| EDU 111 | Education Exploration | 1 |
| EDU 211 | Education Immersion | 1 |
| EDU 232 | Educational Psychology for the Middle & | 2 |

| | | |
|---|---|---|
| | Secondary School Teacher | |
| EDU 301 | Instructional Design Clinical Experience | 1 |
| EDU 303 | Instructional Design | 3 |
| EDU 312 | Exceptional Learners | 2 |
| EDU 322 | Culturally Responsive Teaching | 2 |
| EDU 331 | Literacy in the Content Area Clinical Experience | 1 |
| EDU 332 | Literacy in the Content Area | 2 |
| EDU 362 | Classroom Behavior & Environment | 2 |
| EDU 431 | Secondary Methods Practicum | 1 |
| EDU 442 | Secondary Methods | 2 |
| EDU 462 | Educational Measurement | 2 |
| EDU 411 | Practicum in Teaching - Middle School | 1 |
| EDU 412 | The Middle School | 2 |
| EDU 422 | Middle School Methods | 2 |
| EDU 463 | Educational Media And Technology | 3 |
| EDU 470 | Supervised Student Teaching | 10 |
| EDU 482 | Student Teaching Seminar | 2 |

Electives – 8 hrs.

Elective hours determined in conjunction with advisor and based on student career objectives

| | | |
|---|---|---|
| | Free Electives (8) | 8 |

## Bachelor of Science - Science Education/Chemistry (5-12) and Special Education Mild Interventions (P-12) (122 hrs.)

To be eligible for licensure as a chemistry teacher in grades 5–12 and Special Education for Mild Interventions in grades (P-12), the following program of study must be completed.

**Degree Requirements**

General Education Requirements - 30 hours

Communication – 9 hrs.

| | | |
|---|---|---|
| ENG 143 | College Composition | 3 |
| HUM 203 | Humanities Seminar | 3 |
| SP 203 | Effective Speaking | 3 |
| | Or | |
| COM 163 | Interpersonal Communication | 3 |

The Franks School of Education requires students earn a “C” or higher for ENG 143 and HUM 203 and SP 203 or COM 163.

Humanities and Social Science – 9 hrs.

| | | |
|---|---|---|
| ENG 153 | Introduction to Literature | 3 |
| PSY 113 | Principles of Psychology | 3 |
| EDU 273 | Issues in American Education | 3 |

The Franks School of Education requires students earn a “C” or higher for PSY 113.

Mathematics and Science – 12 hrs.

| | | |
|---|---|---|
| MA 134 | Calculus I | 4 |
| MA 164 | Calculus II | 4 |
| PH 224 | University Physics I | 4 |

Additional Requirements - 92 hours

Required

| | | |
|---|---|---|
| UE 101 | University Experience | 1 |

Chemistry Content Area – 39 hrs.

| | | |
|---|---|---|
| CH 104 | General Chemistry I | 4 |
| CH 114 | General Chemistry II | 4 |
| CH 204 | Organic Chemistry I | 4 |
| CH 234 | Quantitative Chemical Analysis | 4 |
| CH 344 | Inorganic Chemistry | 4 |
| CH 324 | Chemical Instrumental Analysis | 4 |
| CH 354 | Physical Chemistry I | 4 |
| CH 434 | Biochemistry I | 4 |
| MA 213 | Calculus III | 3 |
| BIO 114 | Principles of Biology I | 4 |

Professional Education Requirements – 40 hrs.

| | | |
|---|---|---|
| EDU 111 | Education Exploration | 1 |
| EDU 211 | Education Immersion | 1 |
| EDU 232 | Educational Psychology for the Middle & Secondary School Teacher | 2 |
| EDU 301 | Instructional Design Clinical Experience | 1 |
| EDU 303 | Instructional Design | 3 |
| EDU 322 | Culturally Responsive Teaching | 2 |
| EDU 331 | Literacy in the Content Area Clinical Experience | 1 |
| EDU 332 | Literacy in the Content Area | 2 |
| EDU 362 | Classroom Behavior & Environment | 2 |
| EDU 431 | Secondary Methods Practicum | 1 |
| EDU 442 | Secondary Methods | 2 |
| EDU 462 | Educational Measurement | 2 |
| EDU 411 | Practicum in Teaching - Middle School | 1 |
| EDU 412 | The Middle School | 2 |
| EDU 422 | Middle School Methods | 2 |
| EDU 463 | Educational Media And Technology | 3 |
| EDU 470 | Supervised Student Teaching | 10 |
| EDU 482 | Student Teaching Seminar | 2 |

Special Education Mild Intervention (P-12) – 12 hrs.

| | | |
|---|---|---|
| EDU 181 | Introduction to Teaching Students with Mild Exceptional Needs | 1 |
| EDU 282 | The Development of Students with Mild Except Needs | 2 |
| EDU 382 | Behavioral Analysis of Students with Mild Exceptional Needs | 2 |
| EDU 480 | Special Education Methods Practicum | 0 |
| EDU 483 | Individualized Planning & Assessment of Students with Mild Exceptional Needs | 3 |
| EDU 484 | Methods of Teaching Students with Mild Exceptional Needs | 4 |

# Bachelor of Science - Social Studies Education (5-12) (120 hrs.)

To be eligible for licensure as a social studies teacher in grades 5-12, the following program of study must be completed.

**Degree Requirements**

General Education Requirements - 30 hours

Communication – 9 hrs.

| | | |
|---|---|---|
| ENG 143 | College Composition | 3 |
| HUM 203 | Humanities Seminar | 3 |
| SP 203 | Effective Speaking | 3 |
| | Or | |
| COM 163 | Interpersonal Communication | 3 |

Humanities and Social Science – 9 hrs.

| | | |
|---|---|---|
| ENG 153 | Introduction to Literature | 3 |
| PSY 113 | Principles of Psychology | 3 |
| HIS 103 | American History I | 3 |

Mathematics and Science – 9 hrs.

| | | |
|---|---|---|
| MA 113 | College Algebra | 3 |
| | Or | |
| | Higher Math | |
| | Science Elective (3) | 3 |
| | Math or Science Elective (3) | 3 |

Other – 3 hrs.

| | | |
|---|---|---|
| HIS 113 | American History II | 3 |

Additional Requirements - 90 hours

Required

| | | |
|---|---|---|
| UE 101 | University Experience | 1 |

Social Studies Content Area – 36 hrs.

| | | |
|---|---|---|
| GEO 213 | Physical Geography | 3 |
| HIS 203 | World Civilization I | 3 |
| HIS 213 | World Civilization II | 3 |
| POLS 113 | Introduction to Government | 3 |
| SOC 103 | Principles of Sociology | 3 |
| HIS 323 | The Contemporary World | 3 |

At least Two of the following concentrations:

Economics

| | | |
|---|---|---|
| ECO 213 | Microeconomics | 3 |
| FIN 343 | International Finance | 3 |
| FIN 353 | Personal Finance | 3 |

Government and Citizenship

| | | |
|---|---|---|
| POLS 313 | Comparative Governments | 3 |
| POLS 333 | State & Local Government | 3 |
| POLS 403 | American Constitutional Development | 3 |

Historical Perspectives

| | | |
|---|---|---|
| HIS 273 | Topics in History | 3 |
| HIS 273 | Topics in History | 3 |
| HIS 423 | The United States as a World Power | 3 |

Psychology

| | | |
|---|---|---|
| PSY 323 | Abnormal Psychology | 3 |
| PSY 343 | Social Psychology | 3 |
| PSY 353 | Child & Adolescent Psychology | 3 |

Professional Education Requirements – 45 hrs.

| | | |
|---|---|---|
| EDU 111 | Education Exploration | 1 |
| EDU 211 | Education Immersion | 1 |
| EDU 232 | Educational Psychology for the Middle & Secondary School Teacher | 2 |
| EDU 273 | Issues in American Education | 3 |
| EDU 301 | Instructional Design Clinical Experience | 1 |
| EDU 303 | Instructional Design | 3 |
| EDU 312 | Exceptional Learners | 2 |
| EDU 322 | Culturally Responsive Teaching | 2 |
| EDU 331 | Literacy in the Content Area Clinical Experience | 1 |
| EDU 332 | Literacy in the Content Area | 2 |
| EDU 362 | Classroom Behavior & Environment | 2 |
| EDU 431 | Secondary Methods Practicum | 1 |
| EDU 442 | Secondary Methods | 2 |
| EDU 462 | Educational Measurement | 2 |
| EDU 463 | Educational Media And Technology | 3 |
| EDU 411 | Practicum in Teaching - Middle School | 1 |
| EDU 412 | The Middle School | 2 |
| EDU 422 | Middle School Methods | 2 |
| EDU 470 | Supervised Student Teaching | 10 |
| EDU 482 | Student Teaching Seminar | 2 |

Electives – 8 hrs.

Elective hours determined in conjunction with advisor and based on student career objectives

| | | |
|---|---|---|
| | Free Electives (8) | 8 |

## Bachelor of Science - Social Studies Education (5-12) and Special Education Mild Interventions (P-12) (122 hrs.)

To be eligible for licensure as a social studies teacher in grades 5-12 and Special Education for Mild Intervention in grades P-12, the following program of study must be completed.

**Degree Requirements**

General Education Requirements - 30 hours

Communication – 9 hrs.

| | | |
|---|---|---|
| ENG 143 | College Composition | 3 |
| HUM 203 | Humanities Seminar | 3 |
| SP 203 | Effective Speaking | 3 |

| | | |
|---|---|---|
| | Or | |
| COM 163 | Interpersonal Communication | 3 |

The Franks School of Education requires students earn a “C” or higher for ENG 143 and HUM 203 and SP 203 or COM 163.

Humanities and Social Science – 9 hrs.

| | | |
|---|---|---|
| ENG 153 | Introduction to Literature | 3 |
| PSY 113 | Principles of Psychology | 3 |
| HIS 103 | American History I | 3 |

The Franks School of Education requires students earn a “C” or higher for PSY 113.

Mathematics and Science – 9 hrs.

| | | |
|---|---|---|
| MA 113 | College Algebra | 3 |
| | Or | |
| | Higher Math | |
| | | |
| | Science Elective (3) | 3 |
| | Math or Science Elective (3) | 3 |

Other – 3 hrs.

| | | |
|---|---|---|
| HIS 113 | American History II | 3 |

Additional Requirements - 92 hours

Required

| | | |
|---|---|---|
| UE 101 | University Experience | 1 |

Social Studies Content Area – 36 hrs.

| | | |
|---|---|---|
| GEO 213 | Physical Geography | 3 |
| HIS 203 | World Civilization I | 3 |
| HIS 213 | World Civilization II | 3 |
| POLS 113 | Introduction to Government | 3 |
| SOC 103 | Principles of Sociology | 3 |
| HIS 323 | The Contemporary World | 3 |

At least two of the following concentrations:

Economics

| | | |
|---|---|---|
| ECO 213 | Microeconomics | 3 |
| FIN 343 | International Finance | 3 |
| FIN 353 | Personal Finance | 3 |

Government and Citizenship

| | | |
|---|---|---|
| POLS 313 | Comparative Governments | 3 |
| POLS 333 | State & Local Government | 3 |
| POLS 403 | American Constitutional Development | 3 |

Historical Perspectives

| | | |
|---|---|---|
| HIS 273 | Topics in History | 3 |
| HIS 273 | Topics in History | 3 |
| HIS 423 | The United States as a World Power | 3 |

Psychology

| | | |
|---|---|---|
| PSY 323 | Abnormal Psychology | 3 |
| PSY 343 | Social Psychology | 3 |

| | | |
|---|---|---|
| PSY 353 | Child & Adolescent Psychology | 3 |

Professional Education Requirements – 43 hrs.

| | | |
|---|---|---|
| EDU 111 | Education Exploration | 1 |
| EDU 211 | Education Immersion | 1 |
| EDU 232 | Educational Psychology for the Middle & Secondary School Teacher | 2 |
| EDU 273 | Issues in American Education | 3 |
| EDU 301 | Instructional Design Clinical Experience | 1 |
| EDU 303 | Instructional Design | 3 |
| EDU 322 | Culturally Responsive Teaching | 2 |
| EDU 331 | Literacy in the Content Area Clinical Experience | 1 |
| EDU 332 | Literacy in the Content Area | 2 |
| EDU 362 | Classroom Behavior & Environment | 2 |
| EDU 431 | Secondary Methods Practicum | 1 |
| EDU 442 | Secondary Methods | 2 |
| EDU 462 | Educational Measurement | 2 |
| EDU 463 | Educational Media And Technology | 3 |
| EDU 411 | Practicum in Teaching - Middle School | 1 |
| EDU 412 | The Middle School | 2 |
| EDU 422 | Middle School Methods | 2 |
| EDU 470 | Supervised Student Teaching | 10 |
| EDU 482 | Student Teaching Seminar | 2 |

Special Education Mild Intervention (K-6) – 12 hrs.

| | | |
|---|---|---|
| EDU 181 | Introduction to Teaching Students with Mild Exceptional Needs | 1 |
| EDU 282 | The Development of Students with Mild Except Needs | 2 |
| EDU 382 | Behavioral Analysis of Students with Mild Exceptional Needs | 2 |
| EDU 480 | Special Education Methods Practicum | 0 |
| EDU 483 | Individualized Planning & Assessment of Students with Mild Exceptional Needs | 3 |
| EDU 484 | Methods of Teaching Students with Mild Exceptional Needs | 4 |

# Engineering and Computing

**Trine University's Allen School of Engineering and Computing includes these Departments:**

- DEPARTMENT OF BIOMEDICAL ENGINEERING
  - BACHELOR OF SCIENCE IN BIOMEDICAL ENGINEERING
- MCKETTA DEPARTMENT OF CHEMICAL & BIOPROCESS ENGINEERING
  - BACHELOR OF SCIENCE IN CHEMICAL ENGINEERING
- REINERS DEPARTMENT OF CIVIL & ENVIRONMENTAL ENGINEERING
  - BACHELOR OF SCIENCE IN CIVIL ENGINEERING
- DEPARTMENT OF ELECTRICAL & COMPUTER ENGINEERING
  - BACHELOR OF SCIENCE IN ELECTRICAL ENGINEERING
  - BACHELOR OF SCIENCE IN COMPUTER ENGINEERING
  - BACHELOR OF SCIENCE IN SOFTWARE ENGINEERING
- WADE DEPARTMENT OF MECHANICAL & AEROSPACE ENGINEERING
  - BACHELOR OF SCIENCE IN MECHANICAL ENGINEERING
  - BACHELOR OF SCIENCE IN MECHATRONICS AND ROBOTICS ENGINEERING
- DEPARTMENT OF ENGINEERING TECHNOLOGY
  - BACHELOR OF SCIENCE IN DESIGN ENGINEERING TECHNOLOGY
- DEPARTMENT OF COMPUTER SCIENCE & INFORMATION TECHNOLOGY
  - BACHELOR OF SCIENCE WITH A MAJOR IN COMPUTER SCIENCE & INFORMATION TECHNOLOGY
  - BACHELOR OF SCIENCE IN CYBERSECURITY
  - BACHELOR OF SCIENCE IN EXTENDED REALITY

**The School**

The Drs. Jerry and Jorja Allen School of Engineering and Computing was named in honor of Jerry Allen, a 1978 mechanical engineering graduate and member of the University's Board of Trustees, and Jorja Allen, a 1978 business administration graduate and member of the Alumni Board of Governors.

**Mission**

The Allen School of Engineering and Computing promotes the application of science and technology by preparing graduates for the practice of engineering and engineering technology at the professional level.

**Vision**

The Allen School of Engineering and Computing will be nationally recognized for the quality of its graduates.

**Values**

To attain its mission and vision, the Allen School accepts that the School must educate engineers and technologists:

- who have a broad education;
- who see themselves as global citizens;
- who have the potential for leadership in business and public service; and
- who have a strong ethical foundation.

**Goals**

The Allen School of Engineering and Computing will:

- provide quality preparation for the practice of engineering and engineering technology at the professional level;
- provide graduates with the opportunities to pursue graduate studies, lifelong learning, and to offer service to their profession; and
- provide technical and educational services to the community.

**Programmatic Accreditation**

Trine University's programs in chemical engineering, civil engineering, computer engineering, electrical engineering and mechanical engineering are accredited by the Engineering Accreditation Commission of ABET, http://www.abet.org.

**Programs and Degree Requirements**

The degree programs are listed and then described in the catalog section for each academic department. All undergraduate degrees require students to fulfill General Education requirements (discussed in detail under "General Education Requirements"), as well as specific program requirements.

**Allen School of Engineering and Computing Requirement**

**General Engineering**
Engineering students who are undecided about their major are classified as "general engineers." Since most courses in the first year are common to all engineering disciplines, a general engineering student will still be able to make progress toward an engineering degree, even though a major has not been selected. During this year, the student should be actively investigating the options available in engineering by talking to faculty members and practicing engineers, attending meetings of the student chapters of professional societies, and doing library research. All general engineering students are expected to transfer into one of the engineering majors by the beginning of their second year. While classified as a general engineer, a student would normally take the following courses. The student's instructor in GE 101 Introduction to Engineering can provide additional guidance.

First Semester - 15 hrs.

| | | |
|---|---|---|
| CH 104 | General Chemistry I | 4 |
| ENG 133 | Technical Communication | 3 |
| GE 101 | Introduction to Engineering | 1 |
| MA 134 | Calculus I | 4 |
| | Social Science or Humanities Elective | 3 |

Second Semester - 15-18 hrs.

| | | |
|---|---|---|
| HUM 203 | Humanities Seminar | 3 |
| MA 164 | Calculus II | 4 |
| PH 224 | University Physics I | 4 |
| | Social Science or Humanities Elective | 3 |
| | Engineering or Science Courses | 1-4 |

# Bock Biomedical Engineering Department

## Bachelor of Science in Biomedical Engineering (129 hrs.)

The Bock Department of Biomedical Engineering offers the following degree:

- **Bachelor of Science in Biomedical Engineering**

The biomedical engineering program is accredited by the Engineering Accreditation Commission of ABET, www.abet.org.

The field of biomedical engineering combines knowledge from all of the basic science disciplines: mathematics, chemistry, physics, and biology, as well as the engineering sciences. Due to this inter-disciplinary nature and rapidly advancing knowledge in the field of medicine, the curriculum for a biomedical engineer must also be adaptive and keep up with current advancements. To incorporate these aspects into a biomedical program, the coursework must be grounded in the traditional sciences but also be flexible enough to consider both individual student interests and special topics knowledge of faculty. The biomedical major integrates well with the mission of the University as well as the vision of the Allen School of Engineering.

**Mission**

The mission of the biomedical engineering program at Trine University is to enable and equip students to become productive biomedical engineers, to advance to leadership roles in the profession, and to provide service to society.

**Objectives**

Our graduates will be able to apply their acquired knowledge of biological, medical, and engineering disciplines. In addition, they will exhibit technical competency, effective communication skills, and be a valued team member.

Within a few years after graduation,

1. Graduates will successfully advance in their field and continue to grow professionally and personally.
2. Graduates will contribute to their field through innovation and technology development by solving open-ended problems.
3. Graduates will provide leadership and service to society while maintaining ethical principles and social responsibilities.

**Outcomes**

As specified for accreditation, the biomedical engineering program assures the students will be able to:

1. Identify, formulate, and solve complex engineering problems by applying principles of engineering, science and mathematics
2. Apply engineering design to produce solutions that meet specified needs with considerations of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
3. Communicate effectively with a range of audiences

4. Ability to recognize ethical and professional responsibilities in engineering situations and make informal judgements, which must consider the impact of engineering solutions in global, economic, environmental and societal contexts
5. Ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
6. Ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgement to draw conclusions
7. Ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

**Purposes**

The mission of the Trine University biomedical engineering program is fulfilled through a learning environment featuring the following components:

- curriculum: rigorous, but carefully shaped to provide a path to success;
- faculty: committed to an excellent undergraduate learning experience;
- classrooms: sized and equipped to promote personal attention;
- laboratories: equipped to provide an excellent laboratory experience through many hands-on experiments with direct guidance from full-time faculty;
- mentoring: promoted at all levels – faculty to student and upperclassman to underclassman;
- peer interaction: encouraged and enhanced by team interaction in classwork and laboratories, and membership in student organizations.

**Degree Requirements**

General Education Requirements - 39 hours

Communication – 9 hrs.

| | | |
|---|---|---|
| ENG 133 | Technical Communication | 3 |
| HUM 203 | Humanities Seminar | 3 |
| SP 203 | Effective Speaking | 3 |

Humanities and Social Science – 9 hrs.

| | | |
|---|---|---|
| PHL 313 | Ethics | 3 |
| | Social Science Elective (3) | 3 |
| | Humanities or Social Science Elective | 3 |

Mathematics and Science – 21-24 hrs.

| | | |
|---|---|---|
| MA 134 | Calculus I | 4 |
| MA 164 | Calculus II | 4 |
| CH 104 | General Chemistry I | 4 |
| | And | |
| CH 114 | General Chemistry II | 4 |
| | Or | |
| CH 155H | Advanced Honors General Chemistry | 5 |
| PH 224 | University Physics I | 4 |
| PH 234 | University Physics II | 4 |

Additional Requirements - 14 hours

Required

| | | |
|---|---|---|
| BIO 384 | Human Anatomy & Physiology I | 4 |
| BIO 394 | Human Anatomy & Physiology II | 4 |
| MA 213 | Calculus III | 3 |
| MA 233 | Differential Equations | 3 |

Core Requirements - 76 hours

General Engineering – 1 hrs.

| | | |
|---|---|---|
| GE 101 | Introduction To Engineering | 1 |

Electives – 3 hrs.

Elective hours determined in conjunction with advisor and based on student career objectives

| | | |
|---|---|---|
| | Free Electives (3) | 3 |

Engineering Science – 12-14 hrs.

| | | |
|---|---|---|
| ES 141 | Biology for Engineers | 1 |
| | Or | |
| BIO 114 | Principles of Biology I | 4 |
| ES 213 | Statics | 3 |
| ES 233 | Engineering Materials | 3 |
| ES 382 | Engineering Economics | 2 |
| ES 313 | Thermodynamics | 3 |

Electrical/Computing Engineering – 4 hrs.

| | | |
|---|---|---|
| ECE 213 | Circuit Analysis | 3 |
| ECE 211 | Circuits Laboratory | 1 |

BME Core – 41 hrs.

| | | |
|---|---|---|
| BME 2011 | Intro to BME Programming MATLAB | 1 |
| BME 2012 | Intro to Biomedical Engineering | 2 |
| BME 2401 | BME Design and Manufacturing Lab | 1 |
| BME 2402 | BME Design and Manufacturing | 2 |
| BME 3003 | Musculoskeletal Biomechanics | 3 |
| BME 3103 | Biomaterials | 3 |
| BME 3203 | Biomedical Engineering Laboratory Techniques | 3 |
| BME 3212 | Biomedical Engineering Research Techniques | 2 |
| BME 3223 | Biostatistics and Probability | 3 |
| BME 4403 | Biomedical Engineering Measurements & Instrumentation I | 3 |
| BME 4413 | Biomedical Engineering Measurements & Instrumentation II | 3 |
| BME 4503 | Tissue Engineering | 3 |
| BME 4603 | Bio Fluid Mechanics | 3 |
| BME 4613 | Biological Mass & Energy Transport | 3 |
| BME 4853 | Biomedical Engineering Design I | 3 |
| BME 4863 | Biomedical Engineering Design II | 3 |

BME Concentration Requirements

Choose one (1) of the following three concentration areas

Research Engineering (Health Sciences) Concentration – 15 hrs.

| | | |
|---|---|---|
| CH 204 | Organic Chemistry I | 4 |
| BIO 324 | Microbiology | 4 |
| | Or | |
| CH 214 | Organic Chemistry II | 4 |
| BIO 434 | Biochemistry I | 4 |

Complete one (1) BME XXX3 Elective:

| | | |
|---|---|---|
| BME 4003 | Advanced Topics in Biomechanics | 3 |
| BME 4213 | Introduction to BioMEMS | 3 |
| BME 4303 | Biochemical Engineering | 3 |
| BME 490X | Special Topics in Biomedical Engineering | 3 |

Electrical Engineering Concentration – 15 hrs.

| | | |
|---|---|---|
| CS 1113 | Introduction to Object-Oriented Program | 3 |
| ECE 263 | Digital Systems | 3 |
| ECE 261 | Digital Systems Laboratory | 1 |
| ECE 273 | Microcontrollers | 3 |
| ECE 271 | Microcontrollers Laboratory | 1 |
| ECE 323 | Dynamic Electromagnetic Fields | 3 |
| ECE XXX1 | Elective | 1 |
| | Or | |
| BME XXX1 | Elective | 1 |

Mechanical Engineering Concentration – 15 hrs.

| | | |
|---|---|---|
| EGR 143 | Engineering Graphics | 3 |
| ES 243 | Solid Mechanics | 3 |
| MAE 373 | Computer-Aided Machine Design | 3 |
| BME 4003 | Advanced Topics in Biomechanics | 3 |

Complete one (1) BME XXX3 Elective:

| | | |
|---|---|---|
| BME 4213 | Introduction to BioMEMS | 3 |
| BME 4303 | Biochemical Engineering | 3 |
| BME 490X | Special Topics in Biomedical Engineering | 3 |

# McKetta Department of Chemical and Bioprocess Engineering

## Bachelor of Science in Chemical Engineering (128 hrs.)

The Dr. John J. McKetta Department of Chemical & Bioprocess Engineering was named in honor of Dr. John J. McKetta, a 1937 chemical engineering graduate and member of the University's Board of Trustees. The McKetta Department of Chemical & Bioprocess Engineering offers the following degree:

- **Bachelor of Science in Chemical Engineering**

Trine University's chemical engineering program is accredited by the Engineering Accreditation Commission of

ABET, www.abet.org.

The core classes for chemical engineering are focused on the chemical sciences. The chemical sciences affect virtually every aspect of life: the food we eat, the clothes we wear, the materials for our homes and cars, our medicines and health care products, and the protection of the environment. Chemical engineers are found in every industry.

Chemical engineering is distinctive in its emphasis on chemistry. A chemical engineer takes chemical principles and applies them to industrial processes. Chemical engineering differs from the other engineering disciplines in three main ways. First, chemical engineers work with not only pure or single component materials, but with complex mixtures or multi-component materials. A chemical engineer must characterize and predict the behavior of these complex mixtures. Second, chemical engineers are the purification and separation specialists. The processes for removing impurities or extracting a valuable product are the domain of the chemical engineer. Third, by using chemical or biochemical processes, chemical engineers create materials that did not previously exist. These new and useful components or materials improve the way we live.

Chemical engineers find themselves employed in positions of research and development, process engineering and operations, engineering design and construction, technical sales and service, and plant and corporate management. Typical industries employing chemical engineers include bulk and specialty chemical, petroleum and natural gas, consumer products, pharmaceuticals and biomedical, steel production, plastics and polymers, semiconductor and electronic materials, environmental and consulting. Chemical engineering is also an excellent preparation for those desiring to undertake graduate studies in engineering and other fields such as medicine, law, or business

**Mission**

To offer higher education in chemical and bioprocess engineering by providing a personalized learning environment in which students receive mentoring, small classes, and excellent teaching combined with opportunities for research, industry, and extracurricular experience. The program prepares graduates to succeed, lead and serve to their employers, profession and society.

**Objectives**

To meet this mission, a graduate from the McKetta Department of Chemical & Bioprocess Engineering must be:

1. A Technically Competent Problem Solver – Alumni will be technically competent, with the ability to implement creative problem solving toward their professions as well as non-work related endeavors to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.

2. An Effective Communicator with Collaborative Experience and Leadership Ability - Graduates will provide valuable service and leadership to their community, professional organizations and Trine University through their strong communication and productive teamwork skills.

3. Professionally Obligated - Alumni will demonstrate ethical and professional responsibility and the ability to acquire and apply new knowledge as evidence by advanced elective projects, advanced degrees, professional registration, certificates and other personal and professional development activities.

**Outcomes**

As specified by the accrediting body, engineering programs assure that their students will be able to:

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.

2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.

3. An ability to communicate effectively with a wide range of audiences.

4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgements, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgement to draw conclusions.
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.
8. An ability to recognize hazards associated with chemical, biological, and physical processes and be able to evaluate, minimize, and control these hazards.

**Degree Requirements**

The curriculum requires the completion of 128 hours of coursework. The average course load is 16 hours per semester based on eight semesters. The core requirements may be fulfilled with the Trine courses listed below or others at the department's discretion. Individuals seeking a Bachelor of Science in Chemical Engineering are required to register for the National Council of Examiners for Engineering & Surveying (NCEES) Fundamentals of Engineering (FE) examination prior to graduation.

General Education Requirements - 36 hours

Communication – 9 hours

| | | |
|---|---|---|
| ENG 133 | Technical Communication | 3 |
| HUM 203 | Humanities Seminar | 3 |
| SP 203 | Effective Speaking | 3 |

Humanities and Social Science – 9 hours

| | | |
|---|---|---|
| ECO 203 | Survey of Economics | 3 |
| | Or | |
| ECO 213 | Microeconomics | 3 |
| | Or | |
| ECO 223 | Macroeconomics | 3 |
| | | |
| | Humanities Elective (3) | 3 |
| | Humanities or Social Science Elective | 3 |

Mathematics and Science – 18 hours

| | | |
|---|---|---|
| MA 134 | Calculus I | 4 |
| MA 164 | Calculus II | 4 |
| MA 213 | Calculus III | 3 |
| MA 233 | Differential Equations | 3 |
| PH 224 | University Physics I | 4 |

Additional Requirements - 25 hours

Chemistry – 21-24 hours

| | | |
|---|---|---|
| CH 104 | General Chemistry I | 4 |
| | And | |
| CH 114 | General Chemistry II | 4 |
| | Or | |
| CH 155H | Advanced Honors General Chemistry | 5 |
| | | |
| CH 204 | Organic Chemistry I | 4 |
| CH 234 | Quantitative Chemical Analysis | 4 |

| | | |
|---|---|---|
| CH | CH Elective (8) | 8 |

Electives – 1-4

Elective hours determined in conjunction with advisor and based on student career objectives

Core Requirements - 67 hours

General Engineering – 1 hour

| | | |
|---|---|---|
| GE 101 | Introduction To Engineering | 1 |

Engineering Science – 9 hours

| | | |
|---|---|---|
| ES 141 | Biology for Engineers | 1 |
| CS 1113 | Introduction to Object-Oriented Program | 3 |
| ES 233 | Engineering Materials | 3 |
| ES 382 | Engineering Economics | 2 |

Chemical Engineering Concentration Requirements – 57 hours

| | | |
|---|---|---|
| CHE 122 | Introduction to Chemical Engineering | 2 |
| CHE 204 | Material and Energy Balances | 4 |
| CHE 223 | Measurements and Instrumentation | 3 |
| CHE 313 | Chemical Engineering Thermodynamics I | 3 |
| CHE 253 | Chemical Engineering Calculations | 3 |
| CHE 363 | Chemical Engineering Thermodynamics II | 3 |
| CHE 393 | Stagewise Separations | 3 |
| CHE 303 | Chemical Engineering Fluid Dynamics | 3 |
| CHE 373 | Chemical Engineering Heat Transfer | 3 |
| CHE 333 | Unit Operations Laboratory | 3 |
| CHE 383 | Mass Transfer | 3 |
| CHE 433 | Unit Operations Laboratory II | 3 |
| CHE 453 | Chemical Engineering Kinetics | 3 |
| CHE 473 | Chemical Process Design I | 3 |
| CHE 413 | Chemical Engineering Manufacturing Data Analysis | |
| CHE 463 | Chemical Process Dynamics & Control | 3 |
| CHE 483 | Chemical Process Design II | 3 |
| | Chemical Engineering Electives | 6 |

# Reiners Department of Civil and Environmental Engineering

## Bachelor of Science in Civil Engineering (129 hrs.)

The Reiners Department of Civil and Environmental Engineering offers the following undergraduate degree:

- **Bachelor of Science in Civil Engineering**

The civil engineering program is accredited by the Engineering Accreditation Commission of ABET, www.abet.org.

The civil engineering profession provides for our basic needs: housing, cities, commerce, transportation, education, recreation, clean air, water, environmental projects, and energy production. Civil engineers plan, design, construct and maintain safe and purposeful civic facilities that add to the quality of life.

Today, civil engineers explore the frontiers of high technology for solutions to global needs. They deal with the techniques of

modern computer-integrated design, as well as perform research for new methods and materials of construction. They design and conduct experiments to study the wind effects on tall buildings and the hydrodynamic effects on offshore structures. They use computer simulations to predict hydrologic events, assess flood damage, and manage transportation systems. They employ computers to monitor treatment facilities, lasers for precision surveying, and remote sensing technologies for geodetic surveying.

Based on this vision of the future, the Reiners Department of Civil  Environmental Engineering, with the support of the Allen School of Engineering and Computing and Trine University, will excel in the education of individuals uniquely prepared for the practice of civil engineering at the professional level.

Civil engineering is comprised of many important engineering disciplines including structural engineering, water resources engineering, geotechnical engineering, environmental engineering, highway and transportation engineering, materials science, urban planning, and construction engineering. Civil engineering projects require a combined knowledge of many of these areas, as well as managerial skills, which include the ability to make decisions that are based not only on sound engineering principles, but also on an understanding of the social, ethical, and economic makeup of society. Therefore, it is essential that students receive a broad foundation in the areas of mathematics, physical and engineering sciences, analytical and design methods, communication skills, the social sciences and humanities, and several, if not all, of the civil engineering disciplines mentioned above.

Civil engineers find career opportunities with architectural and engineering firms, construction corporations, material manufacturers, material testing services, utility corporations, and the petroleum and aircraft industries. As many civil engineering projects involve public infrastructure such as highways, bridges, dams, land reclamation and water distribution systems, belong to the public sector, a significant proportion of civil engineers work for local, state and federal governments, as well as the Army Corps of Engineers, the Air Force and the Navy. Those who pursue advanced degrees often enter teaching and research careers in universities.

**Mission**

The mission of the Reiners Department of Civil and Environmental Engineering is to develop work-ready engineers through active learning opportunities, hands-on laboratories and projects, and real-world experiences in a nurturing educational community.

**Objectives**

The following educational objectives have been developed for the civil engineering program at Trine University.

1. Graduates will effectively prepare and present written and verbal proposals, design reports, drawings and other technical information to a diverse audience.
2. Graduates demonstrate the importance of teamwork and leadership in executing projects, including their role within the team and their impact on the scope, budget, and schedule of the project.
3. Graduates can effectively use state of the practice engineering tools.
4. Graduates can analyze and design a structure, system or process, taking into consideration the legal, ethical and other societal impacts of the design.
5. Graduates take an active role in professional development and community outreach, including achieving professional licensure, active participation in professional societies and service to their community.
6. Graduates are engaged in business aspects of the profession, including marketing, budgeting, client and public interaction, and contracting.

**Outcomes**

As specified by the accrediting body, engineering programs assure that their students will be able to:

1. identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics;
2. apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors;
3. communicate effectively with a range of audiences;
4. recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts;
5. function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives;
6. develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions;
7. acquire and apply new knowledge as needed, using appropriate learning strategies.

**Purposes**

The Reiners Department of Civil and Environmental Engineering at Trine University fulfills its mission by providing a dedicated and enhanced learning environment featuring the following components:

- curriculum: rigorous, but carefully shaped to provide a path to success;
- faculty: committed to an excellent undergraduate learning experience;
- classrooms: sized and equipped to promote personal attention;
- laboratories: equipped to provide an engaging and educational laboratory experience through numerous hands-on experiments with direct guidance from full-time faculty;
- mentoring: promoted at all levels – faculty to student, upperclassman to underclassman, and through the services of the Trine Learning Center;
- peer interaction: fostered by team assignments in classes and active membership in student organizations.

**Degree Requirements**

To prepare the student for a professional career in civil engineering, the curriculum listed below is specified. Its flexibility allows considerable freedom to choose courses that best fit a student's interests or objectives. Additional substitutions may be allowed when warranted.

The program design experience begins with the freshman engineering program. Introduction to the design process, ethics, professionalism, economics, and communication skills are presented and explored through individual and team assignments. As the analytical problem-solving capabilities of the students develop in their sophomore and junior years, design projects become more complex and involve engineering specifications, analysis, testing, safety, and societal constraints. Finally, the program design experience is completed with a senior design project. A multi-faceted civil engineering need is identified, and a problem statement is formulated. Alternative solutions are explored, and a detailed design is developed, documented and presented.

To ensure a breadth of knowledge across the civil engineering disciplines, the completion of Civil Engineering In-Depth Electives in three of the following four disciplines of civil engineering is required: environmental engineering, geotechnical engineering, water resources engineering, or transportation engineering. All students must complete Structural Design I and Structural Design Laboratory. The Civil Engineering In-Depth Electives are listed as follows.

General Education Requirements - 41 hours

Communication – 9 hrs.

| | | |
|---|---|---|
| ENG 133 | Technical Communication | 3 |
| HUM 203 | Humanities Seminar | 3 |
| SP 203 | Effective Speaking | 3 |

Humanities and Social Science – 9 hrs.

| | | |
|---|---|---|
| | Social Science Elective (3) | 3 |
| | Humanities Elective (3) | 3 |
| | Humanities or Social Science Elective | 3 |

Mathematics and Science – 23 hrs.

| | | |
|---|---|---|
| MA 134 | Calculus I | 4 |
| MA 164 | Calculus II | 4 |
| MA 213 | Calculus III | 3 |
| CH 104 | General Chemistry I | 4 |
| CH 114 | General Chemistry II | 4 |
| PH 224 | University Physics I | 4 |

Additional Requirements - 6 hours

Required

| | | |
|---|---|---|
| MA 233 | Differential Equations | 3 |
| MA 393 | Probability & Statistics | 3 |
| | Or | |
| BA 6933 | Statistics & Quantitative Methods | 3 |

Please note that approval from the department chair is necessary to take BA 6933.

Core Requirements - 82 hours

General Engineering – 3 hrs.

| | | |
|---|---|---|
| GE 101 | Introduction To Engineering | 1 |
| EGR 152 | Engineering Graphics for Civil Engineering | 2 |

Engineering Science – 14 hrs.

| | | |
|---|---|---|
| ES 213 | Statics | 3 |
| ES 243 | Solid Mechanics | 3 |
| ES 323 | Fluid Mechanics | 3 |
| ES 382 | Engineering Economics | 2 |
| ES 223 | Dynamics | 3 |

Civil Engineering Concentration Requirements – 44 hrs.

| | | |
|---|---|---|
| CE 1023 | Engineering Math | 3 |
| CE 2001 | Basic Surveying Laboratory | 1 |
| CE 2003 | Basic Surveying | 3 |
| CE 3101 | Environmental Engineering Lab | 1 |
| CE 3103 | Environmental Engineering | 3 |
| CE 3201 | Civil Engineering Materials Laboratory | 1 |
| CE 3203 | Civil Engineering Materials | 3 |
| CE 3301 | Hydraulic Engineering Lab | 1 |
| CE 3303 | Hydraulic Engineering | 3 |
| CE 3501 | Structural Analysis Laboratory | 1 |

| | | |
|---|---|---|
| CE 3503 | Structural Analysis I | 3 |
| CE 3521 | Structural Design Laboratory | 1 |
| CE 3523 | Structural Design I | 3 |
| CE 3603 | Transportation Engineering | 3 |
| CE 3701 | Soil Mechanics Laboratory | 1 |
| CE 3703 | Soil Mechanics | 3 |
| CE 3903 | Introduction to Site Development | 3 |
| CE 4911 | Capstone Design I | 1 |
| CE 4913 | Civil & Environmental Engineering Design | 3 |
| CE 4923 | Sustainability in Civil Engineering | 3 |

Civil Engineering In-Depth Electives – 9 hrs.

Select 3 courses for a total of 9 credits

| | | |
|---|---|---|
| CE 4103 | Pollution Control Technologies | 3 |
| CE 4113 | Environmental Remediation | 3 |
| CE 4123 | Water & Wastewater Treatment | 3 |
| CE 4303 | Open Channel Hydraulics | 3 |
| CE 4323 | Engineering Hydrology | 3 |
| CE 4333 | Design of Water Distribution Systems & Sewers | 3 |
| CE 4603 | Highway Geometric Design | 3 |
| CE 4713 | Foundation Engineering | 3 |
| CE 4723 | Pavement Design | 3 |

Additional Electives – 12 hrs.

| | | |
|---|---|---|
| | Business Elective (3) | 3 |
| | Science Elective (3) | 3 |
| | Professional Developmental Elective | 3 |
| | Professional Developmental Elective | 3 |

# Department of Electrical and Computer Engineering

## Bachelor of Science in Electrical Engineering (129 Hours)

The Department of Electrical and Computer Engineering offers the following degrees:

- **Bachelor of Science in Computer Engineering**
- **Bachelor of Science in Electrical Engineering**
- **Bachelor of Science in Software Engineering**

Both the electrical engineering program and the computer engineering program are accredited by the Engineering Accreditation Commission of ABET, www.abet.org.

To prepare students for the innovative work required in these areas, students are provided an undergraduate preparation with a foundation in mathematics and science, proper development in communication skills, an understanding of the relevance and impact of engineering and technology on society, and a combination of classroom study and “hands on” laboratory experience.

In addition to academic activities, engineering experience has become a major factor in acquiring a desired position upon graduation. A Cooperative Educational Program (Co-op) is available to enhance the educational experience and provide necessary industrial experience; students are encouraged to participate in this optional program, and the department and Career Services offer help to any student seeking Co-op or summer employment in the majors.

**Mission**

The Mission in the Department of Electrical and Computer Engineering is to provide students with the nurturing environment of a small school accompanied by academically rigorous programs that prepare graduates for either immediate employment or entry to graduate school.

**Objectives**

The computer, electrical and software engineering programs meet the needs of students, alumni, employers and the faculty by assuring that a few years after graduation:

1. Graduates embrace problem solving and learning as a natural aspect of their work.
2. Graduates value and are valued by their professional teammates.
3. Graduate have broad and deep knowledge of the technical issues that they face.

**Outcomes**

As specified by the accrediting body, our engineering programs assure that graduates will be able to:

1. Identify, formulate and solve complex engineering problems by applying principles of engineering, science and math
2. Apply engineering design to produce solutions that meet specified needs with consideration of public health, safety and welfare as well as global, cultural, social, environmental and economic factors.
3. Communicate effectively with a range of audiences.
4. Recognize ethical and professional responsibilities in engineering situations and make informed judgements which must consider the impact of engineering solutions in global, economic, environmental and societal contexts.
5. Function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks and meet objectives.
6. Develop and conduct appropriate experimentation, analyze and interpret data and use engineering judgement to draw conclusions.
7. Acquire and apply new knowledge as needed, using appropriate learning strategies.

**Purposes**

The Trine University Electrical and Computer Engineering Departments fulfills its Mission by providing a dedicated and enhanced learning environment featuring the following components:

- curriculum: rigorous, but carefully shaped to provide a path to success;
- faculty: committed to an excellent undergraduate learning experience;
- classrooms: sized and equipped to promote personal attention;
- laboratories: equipped to provide an excellent laboratory experience through many hands-on experiments with direct guidance from full-time faculty;
- mentoring: promoted at all levels – faculty to student and upperclassman to underclassman;
- peer interaction: fostered by team assignments in classes and membership in student organization.

**Degree Requirements**

The electrical engineering degree program requires 129 semester hours of study comprising 41 hours of University general education, 9 additional hours of mathematics beyond the general education requirement and 79 hours of program-specific requirements. The program-specific requirements include 1 hour of general engineering courses, 33 hours of required electrical and computer engineering core courses, 10 hours of electrical engineering concentration required courses, 15 hours of ECE-, CS-, or CO-prefixed elective courses, 6 hours of completely free electives at the college level, 5 hours of engineering science elective courses, and 9 hours of restricted electives chosen for depth or breadth; courses can be approved by the department, but some courses are pre-approved: technical drawing EGR 143, any courses based directly or indirectly on calculus, and all 300, 400, and 500 level courses.

This division of courses is planned to assure that electrical students complete lecture and laboratory courses in: circuits, analog electronics, digital electronics, signals, integrated systems, an advanced electrical engineering elective area, and a capstone design project. The format of laboratories and design projects is such that students will experience working as an individual, working with a same-discipline partner or small team, and finally working as part of a multi-disciplinary team.

The degree requirements may be fulfilled with the Trine courses listed below or others at the department's discretion. For curriculum-related details, see the Department Chair.

**International Transfer Credit:**

The electrical engineering program will not accept international transfer credit toward required courses unless the institution granting the credit is either accredited by an agency recognized by the U.S. Department of Education (e.g. Higher Learning Commission) or from a program that is ABET accredited. In all cases, the transcripts must be translated into English to the satisfaction of both the Director of Transfer Pathways and Evaluations and the electrical engineering Program Chair. In addition, the transcript must be accompanied by supporting documentation in English that clearly indicates course content and prerequisites. Transfer credit evaluation will then be made based on the policy in the Trine University course catalog.

A student may appeal the denial of transfer credit by contacting the electrical engineering Program Chair. The Program Chair will then direct the student to the Registrar's office, so that the student may arrange to demonstrate course knowledge using the 'University Credit by Exam' as spelled out in the University catalog.

General Education Requirements - 41 hours

Communication – 9 hrs.

| | | |
|---|---|---|
| ENG 133 | Technical Communication | 3 |
| HUM 203 | Humanities Seminar | 3 |
| SP 203 | Effective Speaking | 3 |

Humanities and Social Science – 9 hrs.

| | | |
|---|---|---|
| | Social Science Elective (3) | 3 |
| | Humanities Elective (3) | 3 |
| | Humanities or Social Science Elective | 3 |

Mathematics and Science – 23 hrs.

| | | |
|---|---|---|
| MA 134 | Calculus I | 4 |
| MA 164 | Calculus II | 4 |
| MA 213 | Calculus III | 3 |
| CH 104 | General Chemistry I | 4 |
| PH 224 | University Physics I | 4 |
| PH 234 | University Physics II | 4 |

Additional Requirements - 9 hours

Required

| | | |
|---|---|---|
| MA 233 | Differential Equations | 3 |

| | | |
|---|---|---|
| MA 393 | Probability & Statistics | 3 |
| MA | 300-400 Level Elective | 3 |

Core Requirements - 79 hours

Electrical and Computer Engineering Concentration Requirements – 33 hrs.

| | | |
|---|---|---|
| CS 1113 | Introduction to Object-Oriented Program | 3 |
| ECE 211 | Circuits Laboratory | 1 |
| ECE 213 | Circuit Analysis | 3 |
| ECE 231 | Discrete Electronics Laboratory | 1 |
| ECE 233 | Discrete Electronics | 3 |
| ECE 343 | Analog Signals | 3 |
| ECE 261 | Digital Systems Laboratory | 1 |
| ECE 263 | Digital Systems | 3 |
| ECE 271 | Microcontrollers Laboratory | 1 |
| ECE 273 | Microcontrollers | 3 |
| ECE 453 | Random Processes in Electrical & Computer Engineering | 3 |
| ECE 3051 | Junior-Year Laboratory | 1 |
| ECE 4001 | Contemporary Issues for Engineers | 1 |
| ECE 4403 | Senior Design I | 3 |
| ECE 4503 | Senior Design II | 3 |

ECE 4503: Or cross-disciplinary project with an in-major oral examination

Electrical Engineering Concentration – 10 hrs.

| | | |
|---|---|---|
| ECE 313 | Electrical Power | 3 |
| ECE 323 | Dynamic Electromagnetic Fields | 3 |
| ECE 481 | Instrument Systems Laboratory | 1 |
| ECE 483 | Instrument Systems | 3 |

Major Electives – 15 hrs.

| | | |
|---|---|---|
| ECE 112 | Prototyping and Projects | 2 |

ECE 112: required only for first-time freshmen

Choose from - 13 hrs.

| | | |
|---|---|---|
| | CO, CS, ECE, or SE prefixed courses; Or | |
| MAE 4023 | System Dynamics & Controls | 3 |

Engineering Science – 5 hrs.

| | | |
|---|---|---|
| ES | ES Elective (2) | 2 |
| ES | ES Elective (2) | 2 |

General Engineering – 1 hr.

| | | |
|---|---|---|
| GE 101 | Introduction To Engineering | 1 |

Restricted Electives – 9 hrs.

Choose from approved courses: EGR 143; Calculus-based; 300-level or higher

Electives – 6 hrs.

Choose from approved courses to bring the total to 129 hours

# Bachelor of Science in Computer Engineering (129 Hours)

The Department of Electrical and Computer Engineering offers the following degrees:

- **Bachelor of Science in Computer Engineering**
- **Bachelor of Science in Electrical Engineering**
- **Bachelor of Science in Software Engineering**

Both the electrical engineering program and the computer engineering program are accredited by the Engineering Accreditation Commission of ABET, www.abet.org.

To prepare students for the innovative work required in these areas, students are provided an undergraduate preparation with a foundation in mathematics and science, proper development in communication skills, an understanding of the relevance and impact of engineering and technology on society, and a combination of classroom study and "hands on" laboratory experience.

In addition to academic activities, engineering experience has become a major factor in acquiring a desired position upon graduation. A Cooperative Educational Program (Co-op) is available to enhance the educational experience and provide necessary industrial experience; students are encouraged to participate in this optional program, and the department and Career Services offer help to any student seeking Co-op or summer employment in the majors.

**Mission**

The Mission in the Department of Electrical and Computer Engineering is to provide students with the nurturing environment of a small school accompanied by academically rigorous programs that prepare graduates for either immediate employment or entry to graduate school.

**Objectives**

The computer, electrical and software engineering programs meet the needs of students, alumni, employers and the faculty by assuring that a few years after graduation:

1. Graduates embrace problem solving and learning as a natural aspect of their work.
2. Graduates value and are valued by their professional teammates.
3. Graduate have broad and deep knowledge of the technical issues that they face.

**Outcomes**

As specified by the accrediting body, our engineering programs assure that graduates will be able to:

1. Identify, formulate and solve complex engineering problems by applying principles of engineering, science and math
2. Apply engineering design to produce solutions that meet specified needs with consideration of public health, safety and welfare as well as global, cultural, social, environmental and economic factors.
3. Communicate effectively with a range of audiences.
4. Recognize ethical and professional responsibilities in engineering situations and make informed judgements which must consider the impact of engineering solutions in global, economic, environmental and societal contexts.
5. Function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks and meet objectives.
6. Develop and conduct appropriate experimentation, analyze and interpret data and use engineering judgement to draw conclusions.

7. Acquire and apply new knowledge as needed, using appropriate learning strategies.

**Purposes**

The Trine University Electrical and Computer Engineering Departments fulfills its Mission by providing a dedicated and enhanced learning environment featuring the following components:

- curriculum: rigorous, but carefully shaped to provide a path to success;
- faculty: committed to an excellent undergraduate learning experience;
- classrooms: sized and equipped to promote personal attention;
- laboratories: equipped to provide an excellent laboratory experience through many hands-on experiments with direct guidance from full-time faculty;
- mentoring: promoted at all levels – faculty to student and upperclassman to underclassman;
- peer interaction: fostered by team assignments in classes and membership in student organization.

**Degree Requirements**

The computer engineering degree program requires 129 semester hours of study comprising 41 hours of University general education, 9 additional hours of mathematics beyond the general education requirement and 79 hours of program-specific requirements. The program-specific requirements include 1 hour of general engineering courses, 33 hours of required electrical and computer engineering core courses, 11 hours of computer engineering concentration required courses, 14 hours of ECE-, CS-, or CO-prefixed elective courses, 5 hours of engineering science courses, 9 hours of restricted elective courses, and 6 hours of open electives.

This division of courses is planned to assure that computer engineering students complete lecture and laboratory courses in: circuits, analog electronics, digital electronics, embedded systems, software design or software engineering, an advanced computer engineering elective area, and a capstone design project. The format of laboratories and design projects is such that students will experience working as an individual, working with a same-discipline partner or small team, and finally working as part of a multi-disciplinary team. Degree requirements may be fulfilled with the Trine courses listed below or others at the department's discretion. For curriculum-related details, see the Department Chair.

**International Transfer Credit:**

The computer engineering program will not accept international transfer credit toward required courses unless the institution granting the credit is either accredited by an agency recognized by the U.S. Department of Education (e.g. Higher Learning Commission) or from a program that is ABET accredited. In all cases, the transcripts must be translated into English to the satisfaction of both the Director of Transfer Pathways and Evaluations and the computer engineering Program Chair. In addition, the transcript must be accompanied by supporting documentation in English that clearly indicates course content and prerequisites. Transfer credit evaluation will then be made based on the policy in the Trine University course catalog.

A student may appeal the denial of transfer credit by contacting the computer engineering Program Chair. The Program Chair will then direct the student to the Registrar's office, so that the student may arrange to demonstrate course knowledge using the 'University Credit by Exam' as spelled out in the University catalog.

General Education Requirements - 41 hours

Communication – 9 hrs.

| | | |
|---|---|---|
| ENG 133 | Technical Communication | 3 |
| HUM 203 | Humanities Seminar | 3 |
| SP 203 | Effective Speaking | 3 |

Humanities and Social Science – 9 hrs.

| | | |
|---|---|---|
| | Social Science Elective (3) | 3 |
| | Humanities Elective (3) | 3 |
| | Humanities or Social Science Elective | 3 |

Mathematics and Science – 23 hrs.

| | | |
|---|---|---|
| MA 134 | Calculus I | 4 |
| MA 164 | Calculus II | 4 |
| MA 213 | Calculus III | 3 |
| CH 104 | General Chemistry I | 4 |
| PH 224 | University Physics I | 4 |
| PH 234 | University Physics II | 4 |

Additional Requirements - 9 hours

Required

| | | |
|---|---|---|
| MA 233 | Differential Equations | 3 |
| MA 393 | Probability & Statistics | 3 |
| MA 473 | Graph Theory & Combinatorics | 3 |

Core Requirements - 79 hours

Electrical and Computer Engineering Concentration Requirements – 33 hrs.

| | | |
|---|---|---|
| CS 1113 | Introduction to Object-Oriented Program | 3 |
| ECE 211 | Circuits Laboratory | 1 |
| ECE 213 | Circuit Analysis | 3 |
| ECE 231 | Discrete Electronics Laboratory | 1 |
| ECE 233 | Discrete Electronics | 3 |
| ECE 343 | Analog Signals | 3 |
| ECE 261 | Digital Systems Laboratory | 1 |
| ECE 263 | Digital Systems | 3 |
| ECE 271 | Microcontrollers Laboratory | 1 |
| ECE 273 | Microcontrollers | 3 |
| ECE 453 | Random Processes in Electrical & Computer Engineering | 3 |
| ECE 3051 | Junior-Year Laboratory | 1 |
| ECE 4001 | Contemporary Issues for Engineers | 1 |
| ECE 4403 | Senior Design I | 3 |
| ECE 4503 | Senior Design II | 3 |

ECE 4503: Or cross-disciplinary project with an in-major oral examination

Computer Engineering Concentration – 11 hrs.

| | | |
|---|---|---|
| CS 1123 | C++ & Object Oriented Design | 3 |
| ECE 361 | Logic & Computer Design Laboratory | 1 |
| ECE 363 | Logic & Computer Design | 3 |
| ECE 371 | Embedded Systems Laboratory | 1 |
| ECE 373 | Embedded Systems | 3 |

Major Electives – 14 hrs.

| | | |
|---|---|---|
| ECE 112 | Prototyping and Projects | 2 |

ECE 112: required only for first-time freshmen

Choose from – 12 hrs.

| | | |
|---|---|---|
| | CO, CS, ECE, or SE prefixed courses; | |
| | Or | |
| MAE 4023 | System Dynamics & Controls | 3 |

Engineering Science – 5 hrs.

| | | |
|---|---|---|
| ES | ES Elective (2) | 2 |
| ES | ES Elective (2) | 2 |

General Engineering – 1 hr.

| | | |
|---|---|---|
| GE 101 | Introduction To Engineering | 1 |

Restricted Electives – 9 hrs.

Choose from approved courses: EGR 143; Calculus-based; 300-level or higher

Electives – 6 hrs.

Choose from approved courses to bring the total to 129 hours

## Bachelor of Science in Software Engineering (128 Hours)

The Department of Electrical and Computer Engineering offers the following degrees:

- **Bachelor of Science in Computer Engineering**
- **Bachelor of Science in Electrical Engineering**
- **Bachelor of Science in Software Engineering**

Both the electrical engineering program and the computer engineering program are accredited by the Engineering Accreditation Commission of ABET, www.abet.org.

To prepare students for the innovative work required in these areas, students are provided an undergraduate preparation with a foundation in mathematics and science, proper development in communication skills, an understanding of the relevance and impact of engineering and technology on society, and a combination of classroom study and “hands on” laboratory experience.

In addition to academic activities, engineering experience has become a major factor in acquiring a desired position upon graduation. A Cooperative Educational Program (Co-op) is available to enhance the educational experience and provide necessary industrial experience; students are encouraged to participate in this optional program, and the department and Career Services offer help to any student seeking Co-op or summer employment in the majors.

**Mission**

The Mission in the Department of Electrical and Computer Engineering is to provide students with the nurturing environment of a small school accompanied by academically rigorous programs that prepare graduates for either immediate employment or entry to graduate school.

**Objectives**

The computer, electrical and software engineering programs meet the needs of students, alumni, employers and the faculty by assuring that a few years after graduation:

1. Graduates embrace problem solving and learning as a natural aspect of their work.
2. Graduates value and are valued by their professional teammates.
3. Graduate have broad and deep knowledge of the technical issues that they face.

**Outcomes**

As specified by the accrediting body, our engineering programs assure that graduates will be able to:

1. Identify, formulate and solve complex engineering problems by applying principles of engineering, science and math
2. Apply engineering design to produce solutions that meet specified needs with consideration of public health, safety and welfare as well as global, cultural, social, environmental and economic factors.
3. Communicate effectively with a range of audiences.
4. Recognize ethical and professional responsibilities in engineering situations and make informed judgements which must consider the impact of engineering solutions in global, economic, environmental and societal contexts.
5. Function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks and meet objectives.
6. Develop and conduct appropriate experimentation, analyze and interpret data and use engineering judgement to draw conclusions.
7. Acquire and apply new knowledge as needed, using appropriate learning strategies.

**Purposes**

The Trine University Electrical and Computer Engineering Departments fulfills its Mission by providing a dedicated and enhanced learning environment featuring the following components:

- curriculum: rigorous, but carefully shaped to provide a path to success;
- faculty: committed to an excellent undergraduate learning experience;
- classrooms: sized and equipped to promote personal attention;
- laboratories: equipped to provide an excellent laboratory experience through many hands-on experiments with direct guidance from full-time faculty;
- mentoring: promoted at all levels – faculty to student and upperclassman to underclassman;
- peer interaction: fostered by team assignments in classes and membership in student organization.

**Degree Requirements**

The software engineering degree program requires 128 semester hours of study comprising 41 hours of University general education, 6 additional hours of mathematics and 3 additional hours of mathematics or science beyond the general education requirement and 78 hours of program-specific requirements. The program-specific requirements include 1 hour of general engineering course, 43 hours of required computer science, electrical and software engineering core courses, 2 hours of engineering science elective courses, 12 hours of COM 343, ECE 361 & 363, CO 453, or any CS- or SE- prefixed elective courses, and 8 hours of open and 12 hours of guided electives. Students are encouraged to use the 17 elective hours to meet the requirements for a minor in an area of their interest.

This division of courses is planned to assure that software students complete lecture and laboratory courses in: circuits, analog electronics, digital electronics, signals, integrated systems, an advanced electrical engineering elective area, and a capstone design project. The format of laboratories and design projects is such that students will experience working as an individual, working with a same-discipline partner or small team, and finally working as part of a multi-disciplinary team.

The degree requirements may be fulfilled with the Trine courses listed below or others at the department's discretion. For curriculum-related details, see the Department Chair.

**International Transfer Credit:**

The software engineering program will not accept international transfer credit toward required courses unless the institution granting the credit is either accredited by an agency recognized by the U.S. Department of Education (e.g. Higher Learning Commission) or from a program that is ABET accredited. In all cases, the transcripts must be translated into English to the satisfaction of both the Director of Transfer Pathways and Evaluations and the software engineering Program Chair. In addition, the transcript must be accompanied by supporting documentation in English that clearly indicates course content and prerequisites. Transfer credit evaluation will then be made based on the policy in the Trine University course catalog.

A student may appeal the denial of transfer credit by contacting the software engineering Program Chair. The Program Chair will then direct the student to the Registrar's office, so that the student may arrange to demonstrate course knowledge using the 'University Credit by Exam' as spelled out in the University catalog.

General Education Requirements - 41 hours

Communication – 9 hrs.

| | | |
|---|---|---|
| ENG 133 | Technical Communication | 3 |
| HUM 203 | Humanities Seminar | 3 |
| SP 203 | Effective Speaking | 3 |

Humanities and Social Science – 9 hrs.

| | | |
|---|---|---|
| | Social Science Elective (3) | 3 |
| | Humanities Elective (3) | 3 |
| | Humanities or Social Science Elective | 3 |

Mathematics and Science – 23 hrs.

| | | |
|---|---|---|
| MA 134 | Calculus I | 4 |
| MA 164 | Calculus II | 4 |
| MA 213 | Calculus III | 3 |
| CH 104 | General Chemistry I | 4 |
| | Or | |
| BIO 114 | Principles of Biology I | 4 |
| PH 224 | University Physics I | 4 |
| PH 234 | University Physics II | 4 |

Additional Requirements - 9 hours

Required

| | | |
|---|---|---|
| MA 393 | Probability & Statistics | 3 |
| MA 473 | Graph Theory & Combinatorics | 3 |
| | Math or Science Elective (3) | 3 |

Core Requirements - 78 hours

General Engineering – 1 hr.

| | | |
|---|---|---|
| GE 101 | Introduction To Engineering | 1 |

Electives – 8 hrs.

Any college-level courses

Restricted Electives – 12 hrs.

9 Hours of Restricted Electives

Chosen from approved courses : Calculus based; 300-level or higher

3 Hours of Restricted Electives

Three hours in the Humanities or Social Sciences, beyond the General Education Requirement.

Engineering Science – 2 hrs.

| | | |
|---|---|---|
| ES 382 | Engineering Economics | 2 |

Software Engineering Core – 43 hrs.

| | | |
|---|---|---|
| CS 1113 | Introduction to Object-Oriented Program | 3 |
| CS 1123 | C++ & Object Oriented Design | 3 |
| CS 2103 | Algorithm Design & Analysis | 3 |
| ECE 261 | Digital Systems Laboratory | 1 |
| ECE 263 | Digital Systems | 3 |
| ECE 271 | Microcontrollers Laboratory | 1 |
| ECE 273 | Microcontrollers | 3 |
| ECE 371 | Embedded Systems Laboratory | 1 |
| ECE 373 | Embedded Systems | 3 |
| SE 4001 | Contemporary Issues for Engineering | 1 |
| SE 153 | Client-side Databases | 3 |
| SE 233 | Systems Programming | 3 |
| SE 353 | Software Engineering | 3 |
| SE 383 | Computer Security | 3 |
| SE 393 | Software Patterns & Team Development | 3 |
| ECE 4403 | Senior Design I | 3 |
| ECE 4503 | Senior Design II | 3 |

Software Engineering Concentration – 12 hrs.

Chosen from below for a total of 12 credit hours:

| | | |
|---|---|---|
| COM 343 | Web Content Management | 3 |
| ECE 361 | Logic & Computer Design Laboratory | 1 |
| | And | |
| ECE 363 | Logic & Computer Design | 3 |
| CO 453 | Co-Op Work Experience | 3 |
| | Or | |
| | CS or SE prefixed courses | 3 |

# Wade Department of Mechanical and Aerospace Engineering

## Bachelor of Science in Mechanical Engineering (129 hrs.)

The Wade Department of Mechanical and Aerospace Engineering offers the following degrees:

- **Bachelor of Science in Mechanical Engineering**
- **Bachelor of Science in Mechatronics and Robotics Engineering**

The mechanical engineering program is accredited by the Engineering Accreditation Commission of ABET, www.abet.org.

Mechanical engineering is, perhaps, the most diverse and general of all the engineering fields. Mechanical engineers can be found working in almost any company. Manufacturing, transportation, health care, and insurance are some of the types of firms that employ mechanical engineers. No other field of engineering provides a better professional base for interdisciplinary activities.

Mechanical engineers design tools and machines of all types, from paper clips to space shuttles. They plan, design, and direct the manufacture, distribution, and operation of these items. Mechanical engineers also design the power sources needed to operate the machines and provide for the environment in which they function. In fact, mechanical engineering involves all phases of energy production and utilization: engines, power plants, electrical generation, heating, ventilating, and air conditioning.

Those mechanical engineers who choose to specialize in the aerospace area are particularly suited for employment in vehicle design. They may be involved in the design of aircraft, spacecraft, missiles, automobiles, trucks, buses, trains, or ships. Their specialized knowledge of lightweight structures and efficient, low drag design take on added importance as fuel costs increase.

Other mechanical engineers may specialize in the area of metallurgy and focus on the relationships among the structure, properties, processing and performance of metals. These engineers will be involved in product design, process development, and equipment design in addition to material specification, failure analysis, and implementing manufacturing processes.

Due to the diverse nature of the profession, the mechanical engineering education must provide a very broad base of studies. To be successful a mechanical engineer must be able to communicate knowledge and ideas to others; thus communication skills are an important part of the engineer's preparation. Studies in the social sciences and humanities develop an understanding of the relevance and impact of engineering and technology on society. Mathematics provides the engineer with the tools needed to build on the scientific foundations of chemistry and physics. The engineering sciences, common to all engineering disciplines, provide a broad foundation for the design of both thermal and mechanical systems, which are at the core of mechanical engineering.

Engineering creativity cannot be developed by theory alone; an engineer learns by doing. Thus, the laboratory courses stress hands-on work and the project design courses involve real-world problems. Multidisciplinary teams, involving students from business, technology, and/or other engineering programs in the senior design projects prepare students for the team design approach common in industry. A cooperative education program, incorporating alternating periods of full-time work and full-time school, is available to enhance the education and provide valuable engineering experience. Students are encouraged to participate in this optional program.

**Mission**

The mission of the mechanical engineering program at Trine University is to enable students to become productive mechanical engineers, to advance to leadership roles in the profession, and to provide service to society.

**Program Objectives**

The mechanical engineering program meet the needs of students, alumni, employers, and the faculty by assuring that a few years after graduation:

1. Our graduates are prepared for the practice of mechanical engineering and related disciplines at the professional level; and
2. Our graduates engage in lifelong learning and serve their professions and community.

**Outcomes**

As specified by ABET, accrediting body for engineering curricula, the mechanical engineering program assures that graduates

will be able to:

1. Identify, formulate and solve complex engineering problems by applying principles of engineering, science and math.
2. Apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare as well as global, cultural, social, environmental and economic factors.
3. Communicate effectively with a range of audiences.
4. Recognize ethical and professional responsibilities in engineering situations and make informed judgements which must consider the impact of engineering solutions in global, economic, environmental and societal contexts.
5. Function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
6. Develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgement to draw conclusions.
7. Acquire and apply new knowledge as needed, using appropriate learning strategies.

**Purposes**

The mission of the Trine University mechanical engineering program is fulfilled through a learning environment comprising the following components:

- curriculum: broad yet appropriately in-depth; rigorous, with a mixture of theory and hands-on experiences;
- faculty: committed to an excellence in teaching;
- classrooms: small and personal;
- laboratories: equipped to provide excellent hands-on experiments with direct oversight of full-time faculty and a skilled laboratory technician;
- peer interaction: encouraged and enhanced by team interaction in classwork and laboratories and membership in student organizations.

**Degree Requirements**

The first year of the mechanical engineering program is devoted to developing knowledge and skills in communication, mathematics, and the natural sciences. Students are introduced to the mechanical engineering profession through the courses Mechanical Engineering Analysis and Engineering Graphics. In the second year the fundamental courses in the engineering sciences provide the foundation for engineering design. The design process is formalized in the junior year in the courses Computer-Aided Machine Design and Thermo-Fluid Component Design. The other courses in the third year emphasize engineering analysis and design in the areas of thermal and mechanical systems. The year-long senior design project integrates the previous studies into the design of a machine or system, most often resulting in fabrication and testing of a prototype. A professional atmosphere is developed through multidisciplinary teams and industry originated projects in the senior design sequence.

**International Transfer Credit:** The mechanical engineering program will not accept international transfer credit toward required courses unless the institution granting the credit is either accredited by an agency recognized by the U.S. Department of Education (e.g. Higher Learning Commission) or from a program that is ABET accredited. In all cases, the transcripts must be translated into English to the satisfaction of both the Director of Transfer Pathways and Evaluations and the mechanical engineering Program Chair. In addition, the transcript must be accompanied by supporting documentation in English that clearly indicates course content and prerequisites. Transfer credit evaluation will then be made based on the policy in the Trine University course catalog.

A student may appeal the denial of transfer credit by contacting the mechanical engineering Program Chair. The Program Chair will then direct the student to the Registrar's office, so that the student may arrange to demonstrate course knowledge using the 'University Credit by Exam' as spelled out in the University catalog.

General Education Requirements - 41 hours

Communication – 9 hrs.

| | | |
|---|---|---|
| ENG 133 | Technical Communication | 3 |
| HUM 203 | Humanities Seminar | 3 |
| SP 203 | Effective Speaking | 3 |

Humanities and Social Science – 9 hrs.

| | | |
|---|---|---|
| ECO 203 | Survey of Economics | 3 |
| | Or | |
| ECO 213 | Microeconomics | 3 |
| | Humanities Elective (3) | 3 |
| | Humanities or Social Science Elective | 3 |

Mathematics and Science – 23 hrs.

| | | |
|---|---|---|
| MA 134 | Calculus I | 4 |
| MA 164 | Calculus II | 4 |
| MA 213 | Calculus III | 3 |
| CH 104 | General Chemistry I | 4 |
| PH 224 | University Physics I | 4 |
| PH 234 | University Physics II | 4 |

Additional Requirements - 12 hours

Required

| | | |
|---|---|---|
| EGR 143 | Engineering Graphics | 3 |
| MA 233 | Differential Equations | 3 |
| MA 313 | Introduction to Linear Algebra | 3 |
| MA 393 | Probability & Statistics | 3 |
| | Or | |
| BA 6933 | Statistics & Quantitative Methods | 3 |

Core Requirements - 76 hours

General Engineering – 1 hour

| | | |
|---|---|---|
| GE 101 | Introduction To Engineering | 1 |

Electives – 6 hrs.

| | | |
|---|---|---|
| | Electives (6) | 6 |

Engineering Science – 23 hrs.

| | | |
|---|---|---|
| ES 213 | Statics | 3 |
| ES 223 | Dynamics | 3 |
| ES 233 | Engineering Materials | 3 |
| ES 243 | Solid Mechanics | 3 |
| ES 253 | Electrical Science | 3 |
| ES 313 | Thermodynamics | 3 |

| | | |
|---|---|---|
| ES 343 | Heat Transfer | 3 |
| ES 382 | Engineering Economics | 2 |

Mechanical Engineering Concentration Requirements – 34 hrs.

| | | |
|---|---|---|
| MAE 112 | Introduction to MATLAB and Excel | 2 |
| MAE 202 | Mechanical Engineering Analysis | 2 |
| MAE 241 | Manufacturing Processes & Equipment Laboratory | 1 |
| MAE 242 | Manufacturing Processes & Equipment | 2 |
| MAE 3033 | Fluid Dynamics for Mechanical Engineers | 3 |
| MAE 323 | Thermodynamics II | 3 |
| MAE 353 | Machine Component Design | 3 |
| MAE 363 | Introduction to Mechatronics | 3 |
| MAE 373 | Computer-Aided Machine Design | 3 |
| MAE 453 | Mechanical Vibration | 3 |
| | Or | |
| MAE 4023 | System Dynamics & Controls | 3 |
| MAE 463 | Mechanical Measure Laboratory | 3 |
| MAE 4053 | Mechanical Engineering Design I | 3 |
| MAE 4063 | Mechanical Engineering Design II | 3 |

Engineering Electives – 12 hrs.

9 credits of Engineering Electives must be MAE courses of 300-level or higher, unless completing an engineering minor. 3 credits of Engineering Electives May be CO 45X, GE 300-level or higher, or an advisor approved 300-level or higher course from an Allen School of Engineering and Computing program.

| | | |
|---|---|---|
| MAE XX3 | | 3 |
| MAE XX3 | | 3 |
| MAE XX3 | | 3 |
| CO 453 | Co-Op Work Experience | 3 |
| CO 452 | Co-Op Work Experience | 2 |
| CO 451 | Co-Op Work Experience | 1 |
| | 300-Level or higher Allen School of Engineering & Computing | 3 |

## Bachelor of Science in Mechatronics and Robotics Engineering (129 hrs.)

The Wade Department of Mechanical and Aerospace Engineering offers the following degrees:

- **Bachelor of Science in Mechanical Engineering**
- **Bachelor of Science in Mechatronics and Robotics Engineering**

Trine University's Bachelor of Science in Mechatronics and Robotics Engineering degree is built on mechanical and electrical engineering principles, with an additional mechatronics and robotics core that prepares graduates for the practice of robotics engineering at the professional level. You will graduate the program with a breadth and depth of knowledge to address technical issues.

**Mission**

The mission of the Mechatronics and Robotics Engineering program at Trine University is to enable students to gain employment in the multidisciplinary field of mechatronics and develop automated systems and smart solutions to solve tomorrow's industry challenges.

**Program Objectives**

The mechatronics and robotics engineering program meets the needs of students, alumni, employers, and the faculty by assuring that a few years after graduation:

1. Our graduates are prepared to apply principles of mechanical and electrical engineering to the practice of engineering at the professional level of robotics, mechatronics and related industries; and
2. Our graduates engage in lifelong learning and serve their professions and community.

**Outcomes**

The mechatronics and robotics engineering program assures that graduates will be able to:

1. Identify, formulate, and solve complex engineering problems by applying principles of engineering, science and mathematics.
2. Apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare as well as global, cultural, social, environmental, and economics factors.
3. Communicate effectively with a range of audiences.
4. Recognize ethical and professional responsibilities in engineering situations and make informed judgements which must consider the impact of engineering solutions in global, economics, environmental and societal contexts.
5. Function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
6. Develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgement to draw conclusions.
7. Acquire and apply new knowledge as needed, using appropriate learning strategies.

**Degree Requirements**

General Education Requirements - 41 hours

Communication – 9 hrs.

| | | |
|---|---|---|
| ENG 133 | Technical Communication | 3 |
| HUM 203 | Humanities Seminar | 3 |
| SP 203 | Effective Speaking | 3 |

Humanities and Social Science – 9 hrs.

| | | |
|---|---|---|
| | Social Science Elective (3) | 3 |
| | Humanities Elective (3) | 3 |
| | Humanities or Social Science Elective | 3 |

Mathematics and Science – 23 hrs.

| | | |
|---|---|---|
| MA 134 | Calculus I | 4 |
| MA 164 | Calculus II | 4 |
| MA 213 | Calculus III | 3 |
| | | |
| CH 104 | General Chemistry I | 4 |
| PH 224 | University Physics I | 4 |
| PH 234 | University Physics II | 4 |

Additional Requirements - 15 hours

Required

| | | |
|---|---|---|
| CS 1113 | Introduction to Object-Oriented Program | 3 |
| EGR 143 | Engineering Graphics | 3 |
| MA 233 | Differential Equations | 3 |
| MA 313 | Introduction to Linear Algebra | 3 |
| MA 393 | Probability & Statistics | 3 |
| | Or | |
| BA 6933 | Statistics & Quantitative Methods | 3 |

Core Requirements - 73 hours

General Engineering – 1 hrs.

| | | |
|---|---|---|
| GE 101 | Introduction To Engineering | 1 |

Electives – 6 hrs.

| | | |
|---|---|---|
| | Electives (6) | 6 |

Engineering Science – 14 hrs.

| | | |
|---|---|---|
| ES 213 | Statics | 3 |
| ES 223 | Dynamics | 3 |
| ES 233 | Engineering Materials | 3 |
| ES 243 | Solid Mechanics | 3 |
| ES 382 | Engineering Economics | 2 |

Electrical/Computer Engineering Concentration Requirements – 15 hrs.

| | | |
|---|---|---|
| ECE 261 | Digital Systems Laboratory | 1 |
| ECE 263 | Digital Systems | 3 |
| ECE 271 | Microcontrollers Laboratory | 1 |
| ECE 273 | Microcontrollers | 3 |
| ECE 211 | Circuits Laboratory | 1 |
| ECE 213 | Circuit Analysis | 3 |
| ECE 343 | Analog Signals | 3 |

Mechanical Engineering – 8hrs.

| | | |
|---|---|---|
| MAE 202 | Mechanical Engineering Analysis | 2 |
| MAE 241 | Manufacturing Processes & Equipment Laboratory | 1 |
| MAE 242 | Manufacturing Processes & Equipment | 2 |
| MAE 353 | Machine Component Design | 3 |

Mechatronics/Robotics Core – 23 hrs.

| | | |
|---|---|---|
| MRE 262 | Robotics Lab & Introduction to Programmable Logic Controllers | 2 |
| MRE 313 | Fluid Power Systems & Design | 3 |
| MRE 323 | Robotic Kinematics & Kinetics | 3 |
| MRE 403 | Machine Communications | 3 |
| MRE 463 | Advanced Mechatronics | 3 |
| MRE 4023 | System Dynamics & Controls | 3 |
| MRE 4053 | Mechatronics & Robotics Engineering Design I | 3 |

| | | |
|---|---|---|
| MRE 4063 | Mechatronics & Robotics Engineering Design II | 3 |

Engineering Electives – 6 hrs.

| | | |
|---|---|---|
| CO 453 | Co-Op Work Experience | 3 |
| CO 452 | Co-Op Work Experience | 2 |
| CO 451 | Co-Op Work Experience | 1 |
| | 300-Level or higher Allen School of Engineering & Computing | 3 |

6 credits of advisor approved Engineering Electives 300-level or higher course from an Allen School of Engineering and Computing program, which could include CO 45X.

# Department of Engineering Technology

## Bachelor of Science in Design Engineering Technology (122 hrs.)

The Department of Engineering Technology offers the following degrees:

- **Bachelor of Science in Design Engineering Technology**

Students are prepared for the innovative design work required in this area. The degree prepares students with a foundation in mathematics and science, and understanding of the relevance and impact of engineering and technology on society. This is achieved through a combination of classroom study and hands on laboratory experiences. Professional communication skills are also emphasized.

In addition to academic activities, field experience can be a major factor in acquiring a desired position upon graduation. Cooperative Educational Programs (Co-op) are available to enhance the educational experience and provide necessary industrial experience. Students are encouraged to participate in these optional programs, and the department and Career Services offer help to any student seeking Co-op or summer employment in their major.

**Mission**

In concert with the mission of Trine University and the Allen School of Engineering and Computing, the Department of Technology will provide an academic environment with an interactive educational climate which produces high quality graduates that are engaged, well-rounded, and technologically experienced.

**Objectives**

1. To produce graduates who are prepared for careers in the areas associated with the analysis, applied design, development, implementation, and oversight of design projects and processes.
2. Foster a desire for personal development to ensure a lifetime of professional advancement, success, and an appreciation for the ethical and social responsibilities of a design engineering technologist.
3. Equip students with sufficient general education studies, including liberal arts, to permit the graduate to communicate effectively and to function as a responsible citizen.

**Degree Requirements**

The design engineering technology curriculum emphasizes many of the underlying principles of component design and the skills required to communicate with other engineers, scientists, and production personnel. Elective course offerings within the academic programs provide the student with the opportunity to minor in areas such as plastics engineering, business, management, marketing, and leadership.

A strong emphasis is placed on the application of skills needed in the modern engineering department. The program provides opportunities to learn the skills and knowledge needed to advance in industry into the upper levels of supervision. Knowledge of computers, management, computer FEA analysis, solid modeling and applied engineering design, and the application of engineering specifications are integrated in this program. This program is approved, strongly supported, and guided by and advisory board of engineers from various industries.

General Education Requirements - 39 hours

Communication – 9 hrs.

| | | |
|---|---|---|
| ENG 133 | Technical Communication | 3 |
| HUM 203 | Humanities Seminar | 3 |
| SP 203 | Effective Speaking | 3 |

Humanities and Social Science – 9 hrs.

| | | |
|---|---|---|
| ECO 213 | Microeconomics | 3 |
| ECO 223 | Macroeconomics | 3 |
| | Humanities Elective (3) | 3 |

Mathematics and Science – 21 hrs.

| | | |
|---|---|---|
| MA 113 | College Algebra | 3 |
| MA 123 | Trigonometry | 3 |
| MA 134 | Calculus I | 4 |
| MA 253 | Statistics | 3 |
| PH 154 | College Physics I | 4 |
| PH 164 | College Physics II | 4 |

Additional Requirements - 4 hours

Required

| | | |
|---|---|---|
| CH 144 | Chemistry - Ideas & Applications | 4 |

Core Requirements - 79 hours

Design Engineering Technology – 49 hrs.

| | | |
|---|---|---|
| ETD 101 | Introduction to Engineering Technology | 1 |
| ETD 103 | Basic Technical Drawing | 3 |
| ETD 113 | Geometric Dimensioning & Tolerancing | 3 |
| ETD 123 | Manufacturing Materials & Processes | 3 |
| ETD 163 | Environmental Health & Safety | 3 |
| ETD 173 | Computer Aided 3-D Modeling | 3 |
| ETD 203 | Basic Mechanisms | 3 |
| ETD 233 | Engineering & Manufacturing Systems | 3 |
| ETD 263 | Design, Analysis & Prototyping | 3 |
| ETD 273 | Electrical Fundamentals | 3 |
| ETD 313 | Design for Manufacture & Assembly | 3 |
| ETD 333 | Statics & Strength of Materials | 3 |
| ETD 363 | Elements Of Machines | 3 |
| ETD 433 | Computer Numerical Control Principles | 3 |
| ETD 463 | Senior Design Project I | 3 |
| ETD 473 | Senior Design Project II | 3 |
| GE 313 | SPC & Lean Manufacturing | 3 |

Additional Requirements – 18 hrs.

| | | |
|---|---|---|
| COM 213 | Business Communication | 3 |
| EGR 453 | Advanced Parametric Design | 3 |

| | | |
|---|---|---|
| CSIT 103 | Introduction to Information Systems | 3 |
| MGT 353 | Designing Operations | 3 |
| MGT 363 | Organizational Behavior | 3 |
| MGT 413 | Management Of Quality | 3 |

Electives – 12 hrs.

| | | |
|---|---|---|
| | Department Approved Elective (3) | 3 |
| | Department Approved Elective (3) | 3 |
| | 300/400 Department Approved Elective | 3 |
| | 300/400 Department Approved Elective | 3 |

# Department of Computer Science and Information Technology

## Bachelor of Science - Computer Science and Information Technology Major (120 hrs.)

The Department of Computer Science and Information Technology offers the following undergraduate degree:

- **Bachelor of Science in Computer Science & Information Technology**

The computer science and information technology program is designed to prepare students for a wide range of endeavors in the information field, including information management, information security, research and information services, and information science.

Graduates of the computer science and information technology program will be qualified for jobs in the information and technology industry and in business, public service, and other various professions. Possible job titles include security and performance analyst, information management specialist, network administrator, product developer, business analyst, usability engineer, database administrator, and many others.

The program also provides strong preparation for graduate studies. Graduates will qualify to be placed in prestigious graduate schools and pursue a variety of programs, including information security, information and management science, information science, information technology, and technical law.

The mission of this program is to provide students with a broadly based and sophisticated understanding of information and its technology, preparing them for careers in this rapidly emerging field.

**Mission**

**CSIT Department Mission Statement**

The CSIT Department exists to educate and mentor the next generation of IT and Computer Science experts while supporting and enhancing the student education experience to transform them into world technology leaders.

**CSIT Advisory Board Mission Statement**

The CSIT Advisory Board exists to support the CSIT Department of Trine University in their endeavors to educate and mentor the next generation of world technology leaders by guiding the curriculum development and providing expert advice, internship, and job opportunities for students.

**Objectives**

**Objectives**

The following educational objectives have been developed for the CSIT program at Trine University:

1. Graduates will effectively prepare and present written and verbal proposals, design reports, programs and other technical information to a diverse audience.
2. Graduates demonstrate the importance of teamwork and leadership in executing projects, including their role within the team and their impact on the scope, budget, and schedule of the project.
3. Graduates can effectively analyze the requirements of an IT project and execute the plan to completion for all areas of IT.
4. Graduates take an active role in professional development and community outreach, including achieving industry known certifications and service to their community.
5. Graduates are trained to understand the business requirements of projects including calculating risk and generating budgets for all resources involved.

**Outcomes**

Our CSIT Program assures that students will be able to:

1. Identify, formulate, and solve complex logic problems by applying principles of computer science;
2. Communicate effectively with a range of audiences;
3. Recognize ethical and professional responsibilities in project development and make informed judgments;
4. Function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives;
5. Develop and conduct appropriate project plans to analyze and interpret project data while keeping in mind the need for security and compliance;
6. Acquire and apply new knowledge as needed, using appropriate learning strategies.

**Degree Requirements**

General Education Requirements - 30 hours

Communication – 9 hrs.

| | | |
|---|---|---|
| ENG 133 | Technical Communication | 3 |
| HUM 203 | Humanities Seminar | 3 |
| SP 203 | Effective Speaking | 3 |

Humanities and Social Science – 9 hrs.

| | | |
|---|---|---|
| PSY 113 | Principles of Psychology | 3 |
| PHL 313 | Ethics | 3 |
| | Humanities or Social Science Elective | 3 |

Mathematics and Science – 12 hrs.

| | | |
|---|---|---|
| MA 113 | College Algebra | 3 |
| MA 173 | Essential Calculus | 3 |
| MA 253 | Statistics | 3 |
| | Science Elective (3) | 3 |

Core Requirements - 90 hours

Content Requirement – 58 hrs.

| | | |
|---|---|---|
| CSIT 101 | Introduction to Computer Science & | 1 |

| | | |
|---|---|---|
| | Information Technology | |
| CSIT 103 | Introduction to Information Systems | 3 |
| CSIT 123 | Computing Infrastructure Basics | 3 |
| CSIT 153 | Introduction to Operating Systems | 3 |
| CSIT 163 | Using Programming to Solve Problems | 3 |
| CSIT 2023 | Linux and PowerShell | 3 |
| CSIT 223 | Network Management | 3 |
| CSIT 253 | Artificial Intelligence & Information | 3 |
| CSIT 273 | Enterprise Architecture | 3 |
| INF 263 | Data Management | 3 |
| INF 343 | Information Security | 3 |
| INF 403 | Advanced Database Management | 3 |
| XR 313 | Mixed Reality Development & Application | 3 |
| BA 123 | Business Concepts | 3 |
| MA 143 | Discrete Mathematics | 3 |
| MA 323 | Operations Research | 3 |
| MGT 303 | Risk Management | 3 |
| MGT 383 | Principles of Project Management | 3 |
| CSIT 483 | Senior Capstone I | 3 |
| CSIT 493 | Senior Capstone II | 3 |

Concentrations – 18 hrs.

Choose one of the concentrations below.

Option A – Cybersecurity

| | | |
|---|---|---|
| CSIT 363 | Certified Ethical Hacking I | 3 |
| CSIT 373 | Certified Ethical Hacking II | 3 |
| CSIT 383 | Certified Ethical Hacking III | 3 |
| CSIT 393 | Certified Ethical Hacking IV | 3 |
| CSIT 403 | Applications of Cybersecurity | 3 |
| CSIT 443 | Advanced Cybersecurity Concepts | 3 |

Option B- Software and Development and Data Science- Choose 18 credit hours from the list below

| | | |
|---|---|---|
| CS 1113 | Introduction to Object-Oriented Program | 3 |
| CS 1123 | C++ & Object Oriented Design | 3 |
| CSIT 243 | Mobile Application Development | 3 |
| INF 383 | Principles of Health Informatics | 3 |
| INF 393 | Data Visualization | 3 |
| INF 433 | Data Mining & Visualization | 3 |
| CS 2103 | Algorithm Design & Analysis | 3 |
| SE 353 | Software Engineering | 3 |
| CSIT 203 | Web Site Design | 3 |
| CSIT 333 | Introduction to E-Commerce Site Development | 3 |
| COM 343 | Web Content Management | 3 |
| SE 303 | Server-Side Databases | 3 |

Option C- Game Design and Virtual Reality

| | | |
|---|---|---|
| CSIT 1023 | The History of Gaming | 3 |
| CSIT 3013 | Introduction to Gameplay Creation | 3 |
| CSIT 3023 | Level, Character, and Story Building | 3 |
| CSIT 4013 | Game Design and Development | 3 |
| CSIT 4023 | Video Game Testing and Quality Assurance | 3 |

| | | |
|---|---|---|
| CSIT 4033 | Virtual Reality Game Production | 3 |
| Electives - 14 hrs. | | |
| | Electives (14) | 14 |

Any college-level courses, including CSIT 311X Internship Experience - (1-3 hours)

# Bachelor of Science in Cybersecurity

In an age defined by digital transformation and rapid technological advancement, the need for cybersecurity professionals has never been more critical. As our world becomes increasingly reliant on interconnected systems, from personal devices to critical infrastructure, the safeguarding of digital assets and information is paramount. This is where our Cybersecurity Degree Program comes into play.

At Trine University, we understand the evolving landscape of cyber threats and the growing demand for experts who can protect, detect, and respond to these challenges effectively. Our Cybersecurity Degree Program is designed to equip students with the knowledge, skills, and practical experience needed to excel in this dynamic and rewarding field.

*Why Choose Our Cybersecurity Degree Program?*

Our curriculum is constantly updated to reflect the latest cybersecurity threats, technologies, and best practices. You'll learn from experienced faculty members who are actively engaged in research and industry partnerships. You'll have access to state-of-the-art labs and simulation environments, allowing you to apply your knowledge in real-world scenarios.

We also prepare you for industry certifications such as Certified Information Systems Security Professional (CISSP), Certified Ethical Hacker (CEH), and CompTIA Security+. These certifications are highly valued by employers and can boost your career prospects.

Graduates of the cybersecurity program will be qualified for jobs as a cybersecurity Analyst, Penetration Tester (Ethical Hacker), Security Consultant, Security Engineer or Architect, Security Compliance Analyst, Forensic Analyst, Chief Information Security Officer (CISO), and many others.

Through our unwavering commitment to excellence, innovation, and ethical leadership, we strive to make a lasting and positive impact on the cybersecurity landscape, securing the digital future for all.

**Mission**

At Trine University, our mission is to empower the next generation of cybersecurity professionals with the knowledge, skills, and ethical values required to protect and defend the digital world.

**Vision**

Our vision is to be recognized as a leading institution for cybersecurity education, research, and practice. We aim to produce graduates who are sought-after cybersecurity experts, capable of addressing complex challenges in the digital realm while adhering to the highest ethical standards.

**Objectives**

The following educational objectives have been developed for the Cybersecurity program at Trine University:

1. Graduates will effectively prepare and present written and verbal proposals, design reports, programs, and other technical information to a diverse audience.

2. Graduates demonstrate the importance of teamwork and leadership in executing projects, including their role within the team and their impact on the scope, budget, and schedule of the project.

3. Graduates take an active role in professional development and community outreach, including achieving industry known

certifications and service to their community.

4. Graduates are trained to understand the business requirements of projects including calculating risk and generating budgets for all resources involved.

**Outcomes**

Our Cybersecurity program assures that students will be able to:

1. Assess emerging cyber threats.
2. Utilize cutting-edge technology, real-world scenarios, and hands-on labs to develop their skills in a safe and controlled environment.
3. Demonstrate a strong sense of ethics and responsibility.
4. Engage with the cybersecurity community, including industry experts, government agencies, and professional organizations.
5. Apply theoretical knowledge of cybersecurity to real-world situations.

**Degree Requirements**

General Education Requirements - 30 hours

Written Communication (6 hrs.)

| | | |
|---|---|---|
| ENG 133 | Technical Communication | 3 |
| HUM 203 | Humanities Seminar | 3 |

Oral Communication (3 hrs.)

| | | |
|---|---|---|
| SP 203 | Effective Speaking | 3 |

Social Science and Humanities (9hrs.)

| | | |
|---|---|---|
| PSY 113 | Principles of Psychology | 3 |
| PHL 313 | Ethics | 3 |
| | Humanities or Social Science Elective | 3 |

Math and Science (12 hrs.)

| | | |
|---|---|---|
| MA 113 | College Algebra | 3 |
| MA 173 | Essential Calculus | 3 |
| MA 253 | Statistics | 3 |
| | Science Elective (3) | 3 |

Cybersecurity Core (61 hrs.)

| | | |
|---|---|---|
| CSIT 101 | Introduction to Computer Science & Information Technology | 1 |
| | Or | |
| UE 111 | Online Learning Orientation | 1 |
| CSIT 123 | Computing Infrastructure Basics | 3 |
| CSIT 153 | Introduction to Operating Systems | 3 |
| CSIT 163 | Using Programming to Solve Problems | 3 |
| CSIT 223 | Network Management | 3 |
| CSIT 253 | Artificial Intelligence & Information | 3 |
| CSIT 2023 | Linux and PowerShell | 3 |
| INF 263 | Data Management | 3 |
| INF 343 | Information Security | 3 |

| | | |
|---|---|---|
| INF 403 | Advanced Database Management | 3 |
| BA 123 | Business Concepts | 3 |
| MGT 303 | Risk Management | 3 |
| MGT 383 | Principles of Project Management | 3 |
| CSIT 2033 | Programming for Cybersecurity | 3 |
| CSIT 2043 | Intro to Cloud Computing and Security | 3 |
| CSIT 2053 | Cybersecurity Law | 3 |
| CSIT 3033 | Malware Analysis and Digital Forensics | 3 |
| CSIT 3043 | Advanced Server Administration | 3 |
| CSIT 443 | Advanced Cybersecurity Concepts | 3 |
| CSIT 483 | Senior Capstone I | 3 |
| | And | |
| CSIT 493 | Senior Capstone II | 3 |
| | Or | |
| IS 483 | Information Systems Capstone Proposal | 3 |
| | And | |
| IS 493 | Information Systems Capstone Project | 3 |

Advanced Cybersecurity Concentration (Angola Campus) (15 hrs.)

| | | |
|---|---|---|
| CSIT 363 | Certified Ethical Hacking I | 3 |
| CSIT 373 | Certified Ethical Hacking II | 3 |
| CSIT 383 | Certified Ethical Hacking III | 3 |
| CSIT 393 | Certified Ethical Hacking IV | 3 |
| CSIT 403 | Applications of Cybersecurity | 3 |

Cybersecurity Professional Concentration (TrineOnline) (15 hrs.)

| | | |
|---|---|---|
| IS 3003 | Ethical Hacker | 3 |
| IS 373 | System Security | 3 |
| IS 383 | Security Analysis | 3 |
| IS 393 | Security CyberOps | 3 |
| IS 403 | Cybersecurity | 3 |

Electives (14 hrs.)

Any college-level courses, including CSIT 311X Internship Experience (1-3 hrs.)

| | | |
|---|---|---|
| | Electives (14) | 14 |

## Bachelor of Science in Extended Reality (120 hrs.)

The Bachelor of Science in Extended Reality (XR) from Trine University, prepares students for the future of technology. The curriculum is intended to prepare students for the exciting opportunity of developing XR apps and various interdisciplinary applications of XR technology. Students receive practical skills that prepare them for a successful journey of innovation in the XR field; student talents are well-rounded for the XR sector, with capabilities spanning from writing immersive tales, to developing XR apps, to applying XR technology to the industry. The curriculum emphasizes skills such as 3D modeling, quality assurance playtesting process, immersive interactive media creation, critical analysis of XR, optimized software engineering, game development using Unity, artificial intelligence, problem-solving, and how to clearly convey ideas in a collaborative environment. The program involves hands-on projects in which students design, build, and deliver XR apps fit for the fast-expanding market.

**Degree Requirements**

General Education Requirements (30 credits)

| | | |
|---|---|---|
| Written Communication (6) | | |
| ENG 133 | Technical Communication | 3 |
| HUM 203 | Humanities Seminar | 3 |
| Oral Communication (3) | | |
| SP 203 | Effective Speaking | 3 |
| Social Sciences and Humanities (9) | | |
| PSY 113 | Principles of Psychology | 3 |
| | Social Sciences or Humanities elective | 3 |
| PHL 313 | Ethics | 3 |
| Math and Sciences (9) | | |
| MA 113 | College Algebra | 3 |
| MA 253 | Statistics | 3 |
| | Science Elective (3) | 3 |
| Other (3) | | |
| BA 113 | Business Computer Applications | 3 |
| Extended Reality Core (54 credits) | | |
| CS 1113 | Introduction to Object-Oriented Program | 3 |
| CS 1123 | C++ & Object Oriented Design | 3 |
| CS 2103 | Algorithm Design & Analysis | 3 |
| CS 2503 | Software Engineering | 3 |
| CSIT 103 | Introduction to Information Systems | 3 |
| CSIT 163 | Using Programming to Solve Problems | 3 |
| CSIT 1023 | The History of Gaming | 3 |
| CSIT 253 | Artificial Intelligence & Information | 3 |
| CSIT 3013 | Introduction to Gameplay Creation | 3 |
| CSIT 3023 | Level, Character, and Story Building | 3 |
| CSIT 4023 | Video Game Testing and Quality Assurance | 3 |
| XR 303 | 3D Modeling & Design for Extended Reality | 3 |
| XR 313 | Mixed Reality Development & Application | 3 |
| XR 323 | Introduction to VR Development (Unity Course) | 3 |
| XR 343 | Introduction to AR Development (Unity Course) | 3 |
| XR 413 | Interdisciplinary Applications of Extended Reality | 3 |
| IS 483 | Information Systems Capstone Proposal | 3 |
| | And | |
| IS 493 | Information Systems Capstone Project | 3 |
| | Or | |
| CSIT 493 | Senior Capstone II | 3 |
| | And | |
| CSIT 483 | Senior Capstone I | 3 |
| Additional Program Requirements (36 credits) | | |
| BA 123 | Business Concepts | 3 |

| | | |
|---|---|---|
| BA 213 | Business Spreadsheets | 3 |
| UE 111 | Online Learning Orientation | 1 |
| | Or | |
| CSIT 101 | Introduction to Computer Science & Information Technology | 1 |
| | Free Electives (29) | 29 |

**Outcomes**

Develop immersive XR experiences using industry-standard platforms like Unity and Blender.
Develop cross-disciplinary communication skills for diverse workplaces.
Write efficient and optimized code for XR applications using professional software development cycles.
Use quality assurance testing methodology and management for market-ready applications.
Analyze the advantages of AR and VR technologies.
Apply AR and VR technologies to real-world problems.

# Health Sciences

**Trine University's Rinker-Ross School of Health Sciences includes these Departments:**

- DEPARTMENT OF EXERCISE SCIENCE
  - BACHELOR OF SCIENCE WITH MAJOR IN APPLIED HEALTH SCIENCE
  - BACHELOR OF SCIENCE WITH MAJOR IN EXERCISE SCIENCE
- DEPARTMENT OF SCIENCE
  - ASSOCIATE IN SCIENCE WITH AN EMPHASIS IN SCIENCE
  - BACHELOR OF ARTS WITH MAJOR IN BIOLOGY
  - BACHELOR OF SCIENCE WITH MAJOR IN BIOCHEMISTRY
    - TRADITIONAL TRACK
    - PHYSICIAN ASSISTANT TRACK
    - PRE-MEDICAL TRACK
  - BACHELOR OF SCIENCE WITH MAJOR IN BIOLOGY
    - TRADITIONAL TRACK
    - PHYSICIAN ASSISTANT TRACK
    - PHYSICAL THERAPY TRACK
    - PRE-MEDICAL TRACK
  - BACHELOR OF SCIENCE WITH MAJOR IN CHEMISTRY
    - TRADITIONAL TRACK
    - PHYSICIAN ASSISTANT TRACK
    - PRE-MEDICAL TRACK
  - BACHELOR OF SCIENCE WITH MAJOR IN ENVIRONMENTAL SCIENCE
  - BACHELOR OF SCIENCE WITH MAJOR IN FORENSIC SCIENCE
    - BIOLOGY CONCENTRATION
    - CHEMISTRY CONCENTRATION
- DIRECT ADMIT PROGRAMS
  - MASTER'S OF PHYSICIAN ASSISTANT STUDIES
    - 3+3 BACHELOR OF SCIENCE IN BIOCHEMISTRY AND A MASTER'S OF PHYSICIAN ASSISTANT STUDIES

    - 3+3 BACHELOR OF SCIENCE IN BIOLOGY AND A MASTER'S OF PHYSICIAN ASSISTANT STUDIES
  - DOCTOR OF OCCUPATIONAL THERAPY
    - 3+3 BACHELOR OF SCIENCE IN APPLIED HEALTH AND A DOCTOR OF OCCUPATIONAL THERAPY
    - 3+3 BACHELOR OF SCIENCE IN EDUCATION STUDIES AND A DOCTOR OF OCCUPATIONAL THERAPY
    - 3+3 BACHELOR OF SCIENCE IN EXERCISE SCIENCE AND A DOCTOR OF OCCUPATIONAL THERAPY
    - 3+3 BACHELOR OF SCIENCE IN PSYCHOLOGY AND A DOCTOR OF OCCUPATIONAL THERAPY
  - DOCTORATE OF PHYSICAL THERAPY
    - 3+3 BACHELOR OF SCIENCE IN BIOLOGY AND A DOCTORATE OF PHYSICAL THERAPY
    - 3+3 BACHELOR OF SCIENCE IN EXERCISE SCIENCE AND A DOCTORATE OF PHYSICAL THERAPY
- PROFESSIONAL TRACKS
  - PRE-MED PROFESSIONAL TRACK
  - PRE-PHYSICAL THERAPY PROFESSIONAL TRACK

# Department of Exercise Science

## Bachelor of Science — Applied Health Science Major (120 hrs.)

The Bachelor of Science in Applied Health Science degree provides a comprehensive foundation in health sciences, emphasizing subjects such as biology, anatomy, physiology, nutrition, health promotion, communication, and ethics. The program is ideal for those interested in diverse healthcare careers and equips graduates with the knowledge and skills needed to excel in various health science roles and make meaningful contributions to the healthcare sector.

**Program Outcomes**

1. Describe the components and importance of health science.
2. Apply the credentials of health careers to the desired career path in health science.
3. Assess standardized metrics in performance, health, and disease models within health science fields.
4. Analyze current research and evidence-based methods as applied to the field of health science.
5. Analyze the components of health science and how they relate to their desired career path.

**Degree Requirements**

General Education Requirements - 31 hours

Communication – 9 hrs.

| | | |
|---|---|---|
| ENG 133 | Technical Communication | 3 |
| | Or | |
| ENG 143 | College Composition | 3 |
| HUM 203 | Humanities Seminar | 3 |

| | | |
|---|---|---|
| SP 203 | Effective Speaking | 3 |

Humanities and Social Science – 9 hrs.

| | | |
|---|---|---|
| PSY 113 | Principles of Psychology | 3 |
| | Humanities Elective (3) | 3 |
| | Social Science Elective (3) | 3 |

Mathematics and Science – 13 hrs.

| | | |
|---|---|---|
| MA 113 | College Algebra | 3 |
| MA 253 | Statistics | 3 |
| BIO 114 | Principles of Biology I | 4 |
| MA 123 | Trigonometry | 3 |

Content Requirements - 74 hours

Applied Health Science Core – 48 hrs.

| | | |
|---|---|---|
| UE 101 | University Experience | 1 |
| AHS 113 | Introduction to Public Health | 3 |
| AHS 203 | Medical Law and Ethics for Health Science | 3 |
| AHS 373/EXS 373 | Health Promotions & Problems | 3 |
| AHS 383/EXS 383 | Health Coaching | 3 |
| AHS 473/EXS 473 | Global Perspectives Health & Wellness | 3 |
| BIO 163 | Medical Terminology | 3 |
| BIO 124 | Principles of Biology II | 4 |
| CH 104 | General Chemistry I | 4 |
| EXS 273 | Nutrition | 3 |
| EXS 363 | Capstone Experience in Health Sciences I | 3 |
| PH 154 | College Physics I | 4 |
| PSY 363/SOC 363 | Human Behavior & Counseling | 3 |
| BIO 204 | Fundamentals of Anatomy & Physiology I | 4 |
| | Or | |
| BIO 384 | Human Anatomy & Physiology I | 4 |
| BIO 224 | Fundamentals of Anatomy & Physiology II | 4 |
| | Or | |
| BIO 394 | Human Anatomy & Physiology II | 4 |

Applied Health Science Elective Content – 26 hrs.

Health Science Electives – Apply credits from a Trine University health science related Associate Degree or choose 26 credits from this section with at least 13 credits being from 300 or above level classes

| | | |
|---|---|---|
| BIO 202 | Introduction to Biological Literature & Communication | 2 |
| BIO 233 | Cell Biology | 3 |
| BIO 324 | Microbiology | 4 |
| BIO 383 | Introduction to Pharmacology | 3 |
| BIO 443 | Pathology | 3 |
| CH 114 | General Chemistry II | 4 |
| EXS 203 | Risk and Sports | 3 |
| EXS 243 | Athletic Training | 3 |
| EXS 263 | Motor Learning | 3 |
| EXS 283 | Fitness Evaluation Assessment | 3 |
| EXS 293 | Biomechanics | 3 |

| | | |
|---|---|---|
| EXS 333 | Kinesiology | 3 |
| EXS 353 | Exercise Physiology | 3 |
| EXS 423 | Evaluation of Athletic Injuries | 3 |
| EXS 453 | Capstone Experience in Health Sciences II | 3 |
| EXS 483 | Professional Development in Exercise Science | 3 |
| EXS 493 | Strength and Conditioning Preparation | 3 |
| PH 164 | College Physics II | 4 |
| SCI 434 | Science Internship | 4 |

Electives – 15 hrs.

Elective hours determined in conjunction with advisor and based on student career objectives.

| | | |
|---|---|---|
| | Electives (15) | 15 |

**Outcomes**

## Bachelor of Science — Exercise Science Major (120 hrs.)

The Bachelor of Science in Exercise Science equips students with the knowledge and experience essential for the exercise science field. The coursework emphasizes subjects such as biology, anatomy, kinesiology, exercise physiology, lifetime wellness, nutrition, health problems and promotion, fitness assessment, and professional ethics. This structured curriculum builds a solid exercise science foundation, encompasses a capstone research project, and includes a real-world internship experience.

**Degree Requirements**

General Education Requirements - 30 hours

Communication – 9 hrs.

| | | |
|---|---|---|
| ENG 133 | Technical Communication | 3 |
| | Or | |
| ENG 143 | College Composition | 3 |
| HUM 203 | Humanities Seminar | 3 |
| SP 203 | Effective Speaking | 3 |

Humanities and Social Science – 9 hrs.

| | | |
|---|---|---|
| PSY 113 | Principles of Psychology | 3 |
| SM 393 | Sport Psychology | 3 |
| | Humanities Elective (3) | 3 |

Mathematics and Science – 10 hrs.

| | | |
|---|---|---|
| MA 113 | College Algebra | 3 |
| BIO 154 | Human Body Systems | 4 |
| BIO 163 | Medical Terminology | 3 |

Other – 2 hrs.

| | | |
|---|---|---|
| EXS 102 | Lifetime Wellness | 2 |

Content Requirement - 55 hours

Required Courses - 43 hours

| | | |
|---|---|---|
| UE 101 | University Experience | 1 |
| EXS 113 | Intro to Exercise Science | 3 |
| EXS 203 | Risk and Sports | 3 |
| EXS 263 | Motor Learning | 3 |

| | | |
|---|---|---|
| EXS 273 | Nutrition | 3 |
| EXS 283 | Fitness Evaluation Assessment | 3 |
| EXS 293 | Biomechanics | 3 |
| EXS 323 | Performance Nutrition | 3 |
| EXS 333 | Kinesiology | 3 |
| EXS 343 | Principles of Human Performance | 3 |
| EXS 353 | Exercise Physiology | 3 |
| EXS 363 | Capstone Experience in Health Sciences I | 3 |
| EXS 373/AHS 373 | Health Promotion & Problems | 3 |
| EXS 383/AHS 383 | Health Coaching | 3 |
| EXS 483 | Professional Development in Exercise Science | 3 |

Exercise Science Electives - 12 hours

12 Exercise Science elective credits from the following: EXS 103, EXS 243, EXS 413, EXS 423, EXS 453, EXS 483 in Coaching, EXS 493, EXS 474, AHS 113, EXS 473.

Electives - 35 hrs

Elective hours determined in conjunction with advisor and based on student career objectives.

**Outcomes**
Understand exercise science and wellness foundational concepts and key terminology.
Perform exercise testing for health, mobility, and performance.
Analyze and synthesize health information for a variety of populations and age groups.
Demonstrate the ability to address individual health and wellness needs.
Assess dynamic movement to improve mobility, functionality, and performance.
Apply a variety of injury prevention and risk management strategies.
Communicate effectively and professionally through written, verbal, and digital mediums, fostering collaboration within groups and teams.
Demonstrate research proficiency and analytical skills.

# Department of Science

## Associate in Science with an Emphasis in Science (60 Hrs.)

The Science Department seeks to prepare students for a professional career by providing a science foundation consisting of a body of information and the ability to use this information to solve problems. Important concepts of this information include the theory and practice of modern laboratory procedures, professional ethics, safety, statistical data handling, and scientific report writing.

The Science Department also seeks to provide non-science majors with an understanding of science as it relates to modern society.

Students who transfer into the Department of Science are expected to take at least two 300- or 400-level courses in their science major.

**Degree Requirements**

General Education Requirements - 18 hours

Communication – 6 hrs.

| | | |
|---|---|---|
| ENG 133 | Technical Communication | 3 |

| | | |
|---|---|---|
| | Or | |
| ENG 143 | College Composition | 3 |

And one of the following:

| | | |
|---|---|---|
| HUM 203 | Humanities Seminar | 3 |
| COM 163 | Interpersonal Communication | 3 |
| SP 203 | Effective Speaking | 3 |

Humanities and Social Science – 6 hrs.

| | | |
|---|---|---|
| | Social Science Elective (3) | 3 |
| | Humanities Elective (3) | 3 |

Mathematics and Science – 6 hrs.

| | | |
|---|---|---|
| | Mathematics Elective (3) | 3 |
| | Science Elective (3) | 3 |

Content Requirements - 42 hours

Required

| | | |
|---|---|---|
| UE 101 | University Experience | 1 |

Electives – 20 hrs.

Elective hours determined in conjunction with advisor and based on student career objectives

| | | |
|---|---|---|
| | Free Electives (20) | 20 |

Sciences Courses – 21 hrs.

Student must complete 21 total hours in science (AST, BIO, CH, FS, GLY, or PH)

| | | |
|---|---|---|
| | Science Elective Courses | 21 |

## Bachelor of Arts with a major in Biology

The Science Department seeks to prepare students for a professional career by providing a science foundation consisting of a body of information and the ability to use this information to solve problems. Important concepts of this information include the theory and practice of modern laboratory procedures, professional ethics, safety, statistical data handling, and scientific report writing.

The Science Department also seeks to provide non-science majors with an understanding of science as it relates to modern society.

Students who transfer into the Department of Science are expected to take at least two 300- or 400-level courses in their science major in addition to SCI 412 Senior Research Seminar and SCI 422 Senior Research Project or SCI 434 Science Internship.

**Outcomes**
**Degree-Requirements**

General Education Requirements - 33 Hours

Communication - 9 hrs.

| | | |
|---|---|---|
| ENG 133 | Technical Communication | 3 |
| | Or | |
| ENG 143 | College Composition | 3 |

| | | |
|---|---|---|
| HUM 203 | Humanities Seminar | 3 |
| SP 203 | Effective Speaking | 3 |
| | Or | |
| COM 163 | Interpersonal Communication | 3 |

Humanities and Social Science - 9 hrs.

| | | |
|---|---|---|
| PHL 313 | Ethics | 3 |
| PSY 113 | Principles of Psychology | 3 |
| SOC 103 | Principles of Sociology | 3 |

Mathematics and Science - 15 hrs.

| | | |
|---|---|---|
| MA 113 | College Algebra | 3 |
| BIO 114 | Principles of Biology I | 4 |
| BIO 124 | Principles of Biology II | 4 |
| CH 104 | General Chemistry I | 4 |

Content Requirements - 87 hrs.

Biology Core - 58 hrs.

| | | |
|---|---|---|
| UE 101 | University Experience | 1 |
| BIO 154 | Human Body Systems | 4 |
| BIO 202 | Introduction to Biological Literature & Communication | 2 |
| BIO 233 | Cell Biology | 3 |
| BIO 253 | Fundamentals of Genetics | 3 |
| BIO 274 | General Ecology | 4 |
| BIO 273 | Analysis of Biological Data | 3 |
| | Or | |
| MA 253 | Statistics | 3 |
| BIO 302 | Professional Practice in Science | 2 |
| BIO 304 | Plant Biology | 4 |
| BIO 314 | Animal Biology | 4 |
| ENG 453 | Advanced Composition | 3 |
| SCI 434 | Science Internship | 4 |
| | Free Electives (21) | 21 |

Science Concentration - 14 hrs.

**Choose one of the following two concentrations**

Human Biology - 14 hrs.

| | | |
|---|---|---|
| BIO 123 | Microbiology for Health Science | 3 |
| BIO 163 | Medical Terminology | 3 |
| BIO 384 | Human Anatomy & Physiology I | 4 |
| BIO 394 | Human Anatomy & Physiology II | 4 |

Environmental Science - 14 hrs.

| | | |
|---|---|---|
| BIO 222 | Field Ecology | 2 |
| BIO 334 | Environmental Biology | 4 |

| | | |
|---|---|---|
| BIO 424 | Conservation | 4 |
| EAS 213/GEO 213 | Physical Geography | 3 |

Career Focused Concentration - 15 hours

**Choose one of the following concentrations (note: completion of a concentration could result in a minor in that field when declared)**

Communication - 15 hours

| | | |
|---|---|---|
| COM 163 | Interpersonal Communication | 3 |
| COM 183 | Writing For The Media | 3 |
| COM 243 | Digital Media Creation | 3 |
| COM 303 | Digital Photography | 3 |
| COM 343 | Web Content Management | 3 |

Data Science - 15 hours

| | | |
|---|---|---|
| CSIT 103 | Introduction to Information Systems | 3 |
| INF 263 | Data Management | 3 |
| INF 393 | Data Visualization | 3 |
| INF 433 | Data Mining & Visualization | 3 |
| MA 203 | Discrete Math for Information Sciences | 3 |

Forensic Science - 15 hours

| | | |
|---|---|---|
| FS 203 | Principles of Forensic Science I | 3 |
| FS 223 | Principles of Forensic Science II | 3 |
| FS 343/CRJ 343 | Criminalistics & Crime Scene Investigations | 3 |
| FS 373 | Forensic Comparative Science | 3 |
| PSY 383 | Forensic Psychology | 3 |

Psychology - 15 hours

| | | |
|---|---|---|
| PSY 223 | Life Span Developmental Psychology | 3 |
| PSY 323 | Abnormal Psychology | 3 |
| PSY 333 | Psychology of Personality | 3 |
| PSY 343 | Social Psychology | 3 |
| PSY 353 | Child & Adolescent Psychology | 3 |

Spanish - 15 hours

| | | |
|---|---|---|
| SPN 203 | Spanish III | 3 |
| SPN 213 | Spanish IV | 3 |
| SPN 303 | Spanish Language | 3 |
| SPN 313 | Spanish Writing & Composition | 3 |
| SPN 323 | Spanish Culture | 3 |

## Bachelor of Science - Biochemistry Major (120 Hrs.)

The Science Department seeks to prepare students for a professional career by providing a science foundation consisting of a body of information and the ability to use this information to solve problems. Important concepts of this information include the theory and practice of modern laboratory procedures, professional ethics, safety, statistical data handling, and scientific report writing.

The Science Department also seeks to provide non-science majors with an understanding of science as it relates to modern society.

Students who transfer into the Department of Science are expected to take at least two 300- or 400-level courses in their science major in addition to SCI 412 Senior Research Seminar and SCI 422 Senior Research Project or SCI 434 Science Internship.

**Degree Requirements**

General Education Requirements - 30 hour

Communication – 9 hrs.

| | | |
|---|---|---|
| ENG 133 | Technical Communication | 3 |
| | Or | |
| ENG 143 | College Composition | 3 |
| HUM 203 | Humanities Seminar | 3 |
| SP 203 | Effective Speaking | 3 |
| | Or | |
| COM 163 | Interpersonal Communication | 3 |

Humanities and Social Science – 9 hrs.

| | | |
|---|---|---|
| PSY 113 | Principles of Psychology | 3 |
| | Humanities Elective (3) | 3 |
| | Social Science Elective (3) | 3 |

Mathematics and Science – 12 hrs.

| | | |
|---|---|---|
| MA 134 | Calculus I | 4 |
| BIO 114 | Principles of Biology I | 4 |
| CH 104 | General Chemistry I | 4 |

Content Requirements - 90 hours

Biochemistry Core – 59 hrs.

| | | |
|---|---|---|
| UE 101 | University Experience | 1 |
| BIO 324 | Microbiology | 4 |
| BIO 233 | Cell Biology | 3 |
| BIO 364 | Toxicology | 4 |
| BIO 414 | Genetics | 4 |
| BIO 454 | Molecular Biology | 4 |
| CH 114 | General Chemistry II | 4 |
| CH 202 | Introduction to Chemical Literature and Communication | 2 |
| CH 204 | Organic Chemistry I | 4 |
| CH 214 | Organic Chemistry II | 4 |
| CH 234 | Quantitative Chemical Analysis | 4 |
| CH 302 | Professional Practice Science | 2 |
| CH 324 | Chemical Instrumental Analysis | 4 |
| CH 434 | Biochemistry I | 4 |
| CH 444/BIO 444 | Biochemistry II | 4 |
| MA 253 | Statistics | 3 |
| SCI 412 | Senior Research Seminar | 2 |
| | And | |
| SCI 422 | Science Research Project | 2 |
| | Or | |
| SCI 434 | Science Internship | 4 |

Biochemistry Tracks – 31 hrs.

Choose one of the following 3 tracks in addition to the Biochemistry Core

Traditional Track

| | | |
|---|---|---|
| MA 164 | Calculus II | 4 |
| MA 213 | Calculus III | 3 |
| CH 354 | Physical Chemistry I | 4 |
| PH 224 | University Physics I | 4 |
| PH 234 | University Physics II | 4 |
| | Science Electives (4) | 4 |
| | General Electives (8) | 8 |

Physician Assistant Track

| | | |
|---|---|---|
| BIO 124 | Principles of Biology II | 4 |
| BIO 163 | Medical Terminology | 3 |
| BIO 384 | Human Anatomy & Physiology I | 4 |
| BIO 394 | Human Anatomy & Physiology II | 4 |
| | Science Electives (8) | 8 |
| | General Electives (8) | 8 |

Pre-Medical Track

| | | |
|---|---|---|
| MA 164 | Calculus II | 4 |
| MA 213 | Calculus III | 3 |
| CH 354 | Physical Chemistry I | 4 |
| PH 224 | University Physics I | 4 |
| PH 234 | University Physics II | 4 |
| SOC 103 | Principles of Sociology | 3 |
| PHL 313 | Ethics | 3 |
| | Science Electives (4) | 4 |

## Bachelor of Science – Biology Major (120 Hrs.)

The Science Department seeks to prepare students for a professional career by providing a science foundation consisting of a body of information and the ability to use this information to solve problems. Important concepts of this information include the theory and practice of modern laboratory procedures, professional ethics, safety, statistical data handling, and scientific report writing.

The Science Department also seeks to provide non-science majors with an understanding of science as it relates to modern society.

Students who transfer into the Department of Science are expected to take at least two 300- or 400-level courses in their science major in addition to SCI 412 Senior Research Seminar and SCI 422 Senior Research Project or SCI 434 Science Internship.

**Degree Requirements**

General Education Requirements - 32 hours

Communication – 9 hrs.

| | | |
|---|---|---|
| ENG 133 | Technical Communication | 3 |
| | Or | |
| ENG 143 | College Composition | 3 |
| HUM 203 | Humanities Seminar | 3 |
| SP 203 | Effective Speaking | 3 |
| | Or | |
| COM 163 | Interpersonal Communication | 3 |

Humanities and Social Science – 9 hrs.

| | | |
|---|---|---|
| PSY 113 | Principles of Psychology | 3 |
| | Humanities Elective (3) | 3 |
| | Social Science Elective (3) | 3 |

Mathematics and Science – 14 hrs.

| | | |
|---|---|---|
| MA 113 | College Algebra | 3 |
| MA 123 | Trigonometry | 3 |
| CH 104 | General Chemistry I | 4 |
| CH 114 | General Chemistry II | 4 |

Content Requirements - 88 hours

Biology Core – 51 hrs.

| | | |
|---|---|---|
| UE 101 | University Experience | 1 |
| BIO 114 | Principles of Biology I | 4 |
| BIO 124 | Principles of Biology II | 4 |
| BIO 202 | Introduction to Biological Literature & Communication | 2 |
| BIO 233 | Cell Biology | 3 |
| BIO 273 | Analysis of Biological Data | 3 |
| | Or | |
| MA 253 | Statistics | 3 |
| BIO 274 | General Ecology | 4 |
| BIO 302 | Professional Practice in Science | 2 |
| BIO 304 | Plant Biology | 4 |
| | Or | |
| BIO 314 | Animal Biology | 4 |
| BIO 324 | Microbiology | 4 |
| | Biology Elective (300-400 Level) (4) | 4 |
| BIO 414 | Genetics | 4 |
| CH 204 | Organic Chemistry I | 4 |
| PH 154 | College Physics I | 4 |
| SCI 412 | Senior Research Seminar | 2 |
| | And | |
| SCI 422 | Science Research Project | 2 |
| | Or | |
| SCI 434 | Science Internship | 4 |

Biology Tracks – 37 hrs.

Choose one of the following 4 tracks in addition to the Biology Core

Traditional Track

| | | |
|---|---|---|
| | Biology Elective (300-400 Level) (10) | 10 |
| | Math or Science Electives (8) | 8 |
| | General Electives (19) | 19 |

Physician Assistant Track

| | | |
|---|---|---|
| BIO 163 | Medical Terminology | 3 |
| BIO 364 | Toxicology | 4 |
| | Or | |
| BIO 454 | Molecular Biology | 4 |
| BIO 383 | Introduction to Pharmacology | 3 |
| | Or | |
| BIO 443 | Pathology | 3 |
| BIO 384 | Human Anatomy & Physiology I | 4 |
| BIO 394 | Human Anatomy & Physiology II | 4 |
| BIO 434 | Biochemistry I | 4 |
| | General Electives (15) | 15 |

Physical Therapy Track

| | | |
|---|---|---|
| ENG 453 | Advanced Composition | 3 |
| BIO 364 | Toxicology | 4 |
| BIO 384 | Human Anatomy & Physiology I | 4 |
| BIO 394 | Human Anatomy & Physiology II | 4 |
| PH 164 | College Physics II | 4 |
| | Biology Elective (300-400 Level) (3) | 3 |
| | General Electives (15) | 15 |

Pre-Medical Track

| | | |
|---|---|---|
| BIO 434 | Biochemistry I | 4 |
| CH 214 | Organic Chemistry II | 4 |
| MA 134 | Calculus I | 4 |
| PH 164 | College Physics II | 4 |
| PHL 313 | Ethics | 3 |
| SOC 103 | Principles of Sociology | 3 |
| | Biology Elective (300-400 Level) (6) | 6 |
| | General Electives (9) | 9 |

# Bachelor of Science - Chemistry Major (120 Hrs.)

The Science Department seeks to prepare students for a professional career by providing a science foundation consisting of a body of information and the ability to use this information to solve problems. Important concepts of this information include the theory and practice of modern laboratory procedures, professional ethics, safety, statistical data handling, and scientific report writing.

The Science Department also seeks to provide non-science majors with an understanding of science as it relates to modern society.

Students who transfer into the Department of Science are expected to take at least two 300- or 400-level courses in their science major in addition to SCI 412 Senior Research Seminar and SCI 422 Senior Research Project or SCI 434 Science Internship.

**Degree Requirements**

General Education Requirements - 30 hours

Communication – 9 hrs.

| | | |
|---|---|---|
| ENG 133 | Technical Communication | 3 |
| | Or | |

| | | |
|---|---|---|
| ENG 143 | College Composition | 3 |
| HUM 203 | Humanities Seminar | 3 |
| SP 203 | Effective Speaking | 3 |
| | Or | |
| COM 163 | Interpersonal Communication | 3 |

Humanities and Social Science – 9 hrs.

| | | |
|---|---|---|
| PSY 113 | Principles of Psychology | 3 |
| | Humanities Elective (3) | 3 |
| | Social Science Elective (3) | 3 |

Mathematics and Science – 12 hrs.

| | | |
|---|---|---|
| MA 134 | Calculus I | 4 |
| MA 164 | Calculus II | 4 |
| BIO 114 | Principles of Biology I | 4 |

Content Requirements - 90 hours

Chemistry Core – 67 hrs.

| | | |
|---|---|---|
| UE 101 | University Experience | 1 |
| CH 104 | General Chemistry I | 4 |
| CH 114 | General Chemistry II | 4 |
| CH 202 | Introduction to Chemical Literature and Communication | 2 |
| CH 204 | Organic Chemistry I | 4 |
| CH 214 | Organic Chemistry II | 4 |
| CH 234 | Quantitative Chemical Analysis | 4 |
| CH 302 | Professional Practice Science | 2 |
| CH 324 | Chemical Instrumental Analysis | 4 |
| CH 344 | Inorganic Chemistry | 4 |
| CH 354 | Physical Chemistry I | 4 |
| CH 374 | Physical Chemistry II | 4 |
| CH 434 | Biochemistry I | 4 |
| CH 444/BIO 444 | Biochemistry II | 4 |
| MA 213 | Calculus III | 3 |
| MA 253 | Statistics | 3 |
| PH 224 | University Physics I | 4 |
| PH 234 | University Physics II | 4 |
| SCI 412 | Senior Research Seminar | 2 |
| | And | |
| SCI 422 | Science Research Project | 2 |
| | Or | |
| SCI 434 | Science Internship | 4 |

Chemistry Tracks – 23 hrs.

Choose one of the following 3 tracks in addition to the Chemistry Core

Traditional Track

| | | |
|---|---|---|
| | General Electives (23) | 23 |

Physician Assistant Track

| | | |
|---|---|---|
| BIO 124 | Principles of Biology II | 4 |
| BIO 163 | Medical Terminology | 3 |
| BIO 324 | Microbiology | 4 |
| BIO 384 | Human Anatomy & Physiology I | 4 |
| BIO 394 | Human Anatomy & Physiology II | 4 |
| | General Elective (4) | 4 |

Pre-Medical Track

| | | |
|---|---|---|
| BIO 124 | Principles of Biology II | 4 |
| SOC 103 | Principles of Sociology | 3 |
| PHL 313 | Ethics | 3 |
| | General Electives (13) | 13 |

## Bachelor of Science Environmental Science (120 Hrs)

The Bachelor of Science in Environmental Science degree will prepare students for careers in environmental monitoring and assessment.

Department Mission: The Science Department seeks to prepare students for a professional career by providing a science foundation consisting of a body of information and the ability to use this information to solve problems. Important concepts of this information include the theory and practice of modern laboratory procedures, professional ethics, safety, statistical data handling, and scientific report writing.

**Program Learning Outcomes**

Upon completion of the Bachelor of Science in Environmental Science, students will be able to:

- Demonstrate a comprehensive understanding of key environmental science principles, theories, and concepts.
- Utilize the scientific method to investigate natural phenomena, interpret the findings, and communicate the results.
- Interpret data obtained from analytical instrumentation using statistical methods.
- Synthesize knowledge from a broad cross-section of natural science disciplines to address current issues in environmental science.
- Design observational and experimental studies to address pertinent environmental topics.
- Summarize findings into written reports.

**Degree Requirements**

General Education Requirements - 32 hours

Communication - 9 hrs.

| | | |
|---|---|---|
| ENG 133 | Technical Communication | 3 |
| | Or | |
| ENG 143 | College Composition | 3 |
| HUM 203 | Humanities Seminar | 3 |
| SP 203 | Effective Speaking | 3 |
| | Or | |
| COM 163 | Interpersonal Communication | 3 |

Humanities and Social Sciences - 9 hrs.

| | | |
|---|---|---|
| PSY 113 | Principles of Psychology | 3 |
| | Humanities Elective (3) | 3 |
| | Social Science Elective (3) | 3 |

Mathematics and Science - 14 hrs.

| | | |
|---|---|---|
| MA 113 | College Algebra | 3 |
| MA 123 | Trigonometry | 3 |
| BIO 114 | Principles of Biology I | 4 |
| CH 104 | General Chemistry I | 4 |

Content Requirements - 88 hours

Environmental Biology Core - 62 hrs.

| | | |
|---|---|---|
| UE 101 | University Experience | 1 |
| BIO 124 | Principles of Biology II | 4 |
| BIO 202 | Introduction to Biological Literature & Communication | 2 |
| BIO 222 | Field Ecology | 2 |
| BIO 273 | Analysis of Biological Data | 3 |
| BIO 253 | Fundamentals of Genetics | 3 |
| BIO 274 | General Ecology | 4 |
| BIO 302 | Professional Practice in Science | 2 |
| BIO 311 | Introduction to Geographic Information Systems (GIS) | 1 |
| BIO 334 | Environmental Biology | 4 |
| BIO 424 | Conservation | 4 |
| CH 114 | General Chemistry II | 4 |
| CH 204 | Organic Chemistry I | 4 |
| CH 234 | Quantitative Chemical Analysis | 4 |
| CH 364/BIO 364 | Toxicology | 4 |
| CE 3103 | Environmental Engineering | 3 |
| CE 3101 | Environmental Engineering Lab | 1 |
| CE 4113 | Environmental Remediation | 3 |
| GEO 213 | Physical Geography | 3 |
| GLY 273 | Geology | 3 |
| EAS 253 | Weather & Climate | 3 |
| SCI 412 | Senior Research Seminar | 2 |
| | And | |
| SCI 422 | Science Research Project | 2 |
| | Or | |
| SCI 434 | Science Internship | 4 |

Electives - 22 hours

| | | |
|---|---|---|
| | General Electives (22) | 22 |

## Bachelor of Science - Forensic Science Major (120 Hrs.)

The Science Department seeks to prepare students for a professional career by providing a science foundation consisting of a body of information and the ability to use this information to solve problems. Important concepts of this information include the theory and practice of modern laboratory procedures, professional ethics, safety, statistical data handling, and scientific report writing.

The Science Department also seeks to provide non-science majors with an understanding of science as it relates to modern society.

Students who transfer into the Department of Science are expected to take at least two 300- or 400-level courses in their science major in addition to SCI 412 Senior Research Seminar and SCI 422 Senior Research Project or SCI 434 Science Internship.

**Degree Requirements**

General Education Requirements - 30 hours

Communication – 9 hrs.

| | | |
|---|---|---|
| ENG 133 | Technical Communication | 3 |
| | Or | |
| ENG 143 | College Composition | 3 |
| HUM 203 | Humanities Seminar | 3 |
| SP 203 | Effective Speaking | 3 |
| | Or | |
| COM 163 | Interpersonal Communication | 3 |

Humanities and Social Science – 9 hrs.

| | | |
|---|---|---|
| PSY 113 | Principles of Psychology | 3 |
| | Humanities Elective (3) | 3 |
| | Social Science Elective (3) | 3 |

Mathematics and Science – 12 hrs.

| | | |
|---|---|---|
| MA 134 | Calculus I | 4 |
| CH 104 | General Chemistry I | 4 |
| BIO 114 | Principles of Biology I | 4 |

Content Requirements - 90 hours

Forensic Science Core – 51 hrs.

| | | |
|---|---|---|
| UE 101 | University Experience | 1 |
| CH 114 | General Chemistry II | 4 |
| CH 204 | Organic Chemistry I | 4 |
| CH 214 | Organic Chemistry II | 4 |
| CH 234 | Quantitative Chemical Analysis | 4 |
| CH 364/BIO 364 | Toxicology | 4 |
| CH 434 | Biochemistry I | 4 |
| CH 474 | Forensic Chemistry | 4 |
| FS 203 | Principles of Forensic Science I | 3 |
| FS 223 | Principles of Forensic Science II | 3 |
| FS 343/CRJ 343 | Criminalistics & Crime Scene Investigations | 3 |
| FS 351 | Criminalistics & Crime Scene Laboratory | 1 |
| FS 373 | Forensic Comparative Science | 3 |
| FS 422 | Expert Testimony in Forensic Science | 2 |
| MA 253 | Statistics | 3 |
| SCI 412 | Senior Research Seminar | 2 |
| | And | |
| SCI 422 | Science Research Project | 2 |
| | Or | |
| SCI 434 | Science Internship | 4 |

Forensic Science Concentrations – 39 hrs.

Choose one of the following 2 concentrations in addition to the Forensic Science Core

*Students interested in the Pre-Medical track would need to take the appropriate additional coursework, which would include BIO 124 (for those students in the chemistry concentration), SOC 103 and PHL 313. This would result in earning more than the 120 hours prescribed for the forensic science degree.*

Biology Concentration

| | | |
|---|---|---|
| PH 154 | College Physics I | 4 |
| PH 164 | College Physics II | 4 |
| BIO 202 | Introduction to Biological Literature & Communication | 2 |
| BIO 302 | Professional Practice in Science | 2 |
| BIO 324 | Microbiology | 4 |
| BIO 233 | Cell Biology | 3 |
| BIO 374 | Forensic Biology | 4 |
| BIO 414 | Genetics | 4 |
| BIO 454 | Molecular Biology | 4 |

Chemistry Concentration

| | | |
|---|---|---|
| MA 164 | Calculus II | 4 |
| MA 213 | Calculus III | 3 |
| PH 224 | University Physics I | 4 |
| PH 234 | University Physics II | 4 |
| CH 202 | Introduction to Chemical Literature and Communication | 2 |
| CH 302 | Professional Practice Science | 2 |
| CH 324 | Chemical Instrumental Analysis | 4 |
| CH 344 | Inorganic Chemistry | 4 |
| CH 354 | Physical Chemistry I | 4 |

Free Electives - 8 hrs.

| | | |
|---|---|---|
| | Free Electives (8) | 8 |

# Direct Admit Programs & Professional Tracks

## Direct Admit Programs

DIRECT ADMIT PROGRAMS

- MASTER'S OF PHYSICIAN ASSISTANT STUDIES
    - 3+3 BACHELOR OF SCIENCE IN BIOCHEMISTRY AND A MASTER’S OF PHYSICIAN ASSISTANT STUDIES
    - 3+3 BACHELOR OF SCIENCE IN BIOLOGY AND A MASTER’S OF PHYSICIAN ASSISTANT STUDIES
- DOCTOR OF OCCUPATIONAL THERAPY
    - 3+3 BACHELOR OF SCIENCE IN APPLIED HEALTH AND A DOCTOR OF OCCUPATIONAL THERAPY
    - 3+3 BACHELOR OF SCIENCE IN EDUCATION STUDIES AND A DOCTOR OF OCCUPATIONAL THERAPY

- 3+3 BACHELOR OF SCIENCE IN EXERCISE SCIENCE AND A DOCTOR OF OCCUPATIONAL THERAPY
- 3+3 BACHELOR OF SCIENCE IN PSYCHOLOGY AND A DOCTOR OF OCCUPATIONAL THERAPY

- DOCTORATE OF PHYSICAL THERAPY
  - 3+3 BACHELOR OF SCIENCE IN BIOLOGY AND A DOCTORATE OF PHYSICAL THERAPY
  - 3+3 BACHELOR OF SCIENCE IN EXERCISE SCIENCE AND A DOCTORATE OF PHYSICAL THERAPY

## 3+3 Bachelor of Science in Applied Health Science and a Doctor of Occupational Therapy

The Bachelor of Science in Applied Health Science degree provides a comprehensive foundation in health sciences, emphasizing subjects such as biology, anatomy, physiology, nutrition, health promotion, communication, and ethics. The program is ideal for those interested in diverse healthcare careers and equips graduates with the knowledge and skills needed to excel in various health science roles and make meaningful contributions to the healthcare sector.

**Degree Requirements**

General Education Requirements - 31 hours

Communication – 9 hrs.

| | | |
|---|---|---|
| ENG 133 | Technical Communication | 3 |
| | Or | |
| ENG 143 | College Composition | 3 |
| HUM 203 | Humanities Seminar | 3 |
| SP 203 | Effective Speaking | 3 |

Humanities and Social Science – 9 hrs.

| | | |
|---|---|---|
| PSY 113 | Principles of Psychology | 3 |
| | Humanities Elective (3) | 3 |
| | Social Science Elective (3) | 3 |

Mathematics and Science – 13 hrs.

| | | |
|---|---|---|
| MA 113 | College Algebra | 3 |
| MA 123 | Trigonometry | 3 |
| MA 253 | Statistics | 3 |
| BIO 114 | Principles of Biology I | 4 |

Content Requirement - 48 hours

| | | |
|---|---|---|
| UE 101 | University Experience | 1 |
| AHS 113 | Introduction to Public Health | 3 |
| BIO 163 | Medical Terminology | 3 |
| AHS 203 | Medical Law and Ethics for Health Science | 3 |
| AHS 373/EXS 373 | Health Promotions & Problems | 3 |
| AHS 383/EXS 383 | Health Coaching | 3 |
| AHS 473/EXS 473 | Global Perspectives Health & Wellness | 3 |
| BIO 124 | Principles of Biology II | 4 |
| BIO 204 | Fundamentals of Anatomy & Physiology I | 4 |
| | Or | |
| BIO 384 | Human Anatomy & Physiology I | 4 |
| BIO 224 | Fundamentals of Anatomy & Physiology II | 4 |
| | Or | |

| | | |
|---|---|---|
| BIO 394 | Human Anatomy & Physiology II | 4 |
| | | |
| CH 104 | General Chemistry I | 4 |
| EXS 273 | Nutrition | 3 |
| EXS 363 | Capstone Experience in Health Sciences I | 3 |
| PH 154 | College Physics I | 4 |
| PSY 363/SOC 363 | Human Behavior & Counseling | 3 |

Electives - 11 hrs

Elective hours determined in conjunction with advisor and based on graduate school preparation.

Occupational Therapy Required Courses – 38 hrs.

Occupational Therapy coursework is taken in the student's fourth year of study, which counts for both degrees via credit sharing.

| | | |
|---|---|---|
| OTD 5111 | CARE I | 1 |
| OTD 5113 | Occupational Therapy Fundamentals | 3 |
| OTD 5123 | OT Theory & Behavioral Health | 3 |
| OTD 5133 | Innovations in Practice | 3 |
| OTD 5191 | Occupation Based Intervention 1 | 1 |
| OTD 5221 | CARE II | 1 |
| OTD 5222 | Principles of Documentation | 2 |
| OTD 5232 | Professional Development | 2 |
| OTD 5243 | Scholarly Inquiry & EBP I | 3 |
| OTD 5251 | Occupation-Based Intervention 2 | 1 |
| OTD 5253 | OT Theory & Pediatrics | 3 |
| OTD 5322 | Applied Physiology I | 2 |
| OTD 5331 | CARE III | 1 |
| OTD 5332 | Practice Design and Simulation | 2 |
| OTD 5333 | Movement & Occupational Analysis | 3 |
| OTD 5343 | Scholarly Inquiry and EBP II | 3 |
| OTD 5351 | Occupation-Based Intervention 3 | 1 |
| OTD 5353 | OT Theory & Adults | 3 |

## 3+3 Bachelor of Science in Education Studies and a Doctor of Occupational Therapy

This area is required for me to approve in the system, so I am writing something here. -Alison

Note: Our other 3+3 programs do not have a description. We will review this over the summer.

**3+3 Degree Path for a Bachelor of Science in Education Studies and a Doctor of Occupational Therapy**

General Education Requirements - 42 hours

Communication - 9 hrs.

| | | |
|---|---|---|
| ENG 143 | College Composition | 3 |
| HUM 203 | Humanities Seminar | 3 |
| SP 203 | Effective Speaking | 3 |

Humanities and Social Science - 12 hrs

| | | |
|---|---|---|
| ENG 153 | Introduction to Literature | 3 |
| | Humanities Elective (3) | 3 |
| | Social Science Elective (6) | 6 |

Mathematics and Science - 9 hrs

| | | |
|---|---|---|
| MA 113 | College Algebra | 3 |
| | Science Elective (3) | 3 |
| | Math or Science Elective (3) | 3 |

BIO 163 Medical Terminology is recommended but not required for the science elective.

MA 253 Statistics is recommended but not required for the math or science elective.

Other - 12 hrs

| | | |
|---|---|---|
| PSY 113 | Principles of Psychology | 3 |
| | General Electives (9) | 9 |

Required - 2 hrs

| | | |
|---|---|---|
| UE 101 | University Experience | 1 |
| EXS 211 | Exploring Occupational Therapy | 1 |

Education Studies Content - 23 hrs

Students must choose 23 credit hours from the education courses listed below. The following courses have prerequisites that will be waived for 3+3 students: EDU 282, EDU 382, and EDU 483.

| | | |
|---|---|---|
| EDU 111 | Education Exploration | 1 |
| EDU 181 | Introduction to Teaching Students with Mild Exceptional Needs | 1 |
| EDU 211 | Education Immersion | 1 |
| EDU 222 | Educational Psychology for the Elementary Teacher | 2 |
| EDU 232 | Educational Psychology for the Middle & Secondary School Teacher | 2 |
| EDU 273 | Issues in American Education | 3 |
| EDU 282 | The Development of Students with Mild Except Needs | 2 |
| EDU 322 | Culturally Responsive Teaching | 2 |
| EDU 252 | School & Community Health | 2 |
| EDU 362 | Classroom Behavior & Environment | 2 |
| EDU 382 | Behavioral Analysis of Students with Mild Exceptional Needs | 2 |
| EDU 483 | Individualized Planning & Assessment of Students with Mild Exceptional Needs | 3 |
| EDU 4103 | Education Studies Internship | 3 |

Exercise Science Minor - 15 hrs.

| | | |
|---|---|---|
| EXS 483 | Professional Development in Exercise Science | 3 |

Choose 12 credits from the following (12 hrs.)

| | | |
|---|---|---|
| BIO 154 | Human Body Systems | 4 |
| EXS 102 | Lifetime Wellness | 2 |
| EXS 103 | Teaching Sport Skills I | 3 |
| EXS 273 | Nutrition | 3 |
| EXS 283 | Fitness Evaluation Assessment | 3 |
| EXS 333 | Kinesiology | 3 |
| EXS 353 | Exercise Physiology | 3 |
| EXS 373/AHS 373 | Health Promotion & Problems | 3 |

Second Minor - 15 hrs.

Must complete at least 15 credit hours towards a second minor.

Occupational Therapy Required Courses - 23 hrs.

Occupational Therapy coursework is taken in the student's fourth year of study.

| | | |
|---|---|---|
| OTD 5111 | CARE I | 1 |
| OTD 5113 | Occupational Therapy Fundamentals | 3 |
| OTD 5123 | OT Theory & Behavioral Health | 3 |
| OTD 5133 | Innovations in Practice | 3 |
| OTD 5191 | Occupation Based Intervention 1 | 1 |
| OTD 5221 | CARE II | 1 |
| OTD 5222 | Principles of Documentation | 2 |
| OTD 5232 | Professional Development | 2 |
| OTD 5243 | Scholarly Inquiry & EBP I | 3 |
| OTD 5251 | Occupation-Based Intervention 2 | 1 |
| OTD 5253 | OT Theory & Pediatrics | 3 |

## 3+3 Bachelors of Science in Exercise Science and a Doctor of Occupational Therapy

The Bachelor of Science in Exercise Science equips students with the knowledge and experience essential for the exercise science field. The coursework emphasizes subjects such as biology, anatomy, kinesiology, exercise physiology, lifetime wellness, nutrition, health problems and promotion, fitness assessment, and professional ethics. This structured curriculum builds a solid exercise science foundation, encompasses a capstone research project, and includes a real-world internship experience.

**Degree Requirements**

General Education Requirements - 30 hours

Communication – 9 hrs.

| | | |
|---|---|---|
| ENG 133 | Technical Communication | 3 |
| | Or | |
| ENG 143 | College Composition | 3 |
| HUM 203 | Humanities Seminar | 3 |
| SP 203 | Effective Speaking | 3 |

Humanities and Social Science – 9 hrs.

| | | |
|---|---|---|
| PSY 113 | Principles of Psychology | 3 |
| | PSY (200 Level or Above) Elective (3) | 3 |
| | Humanities Elective (3) | 3 |

Mathematics and Science – 10 hrs.

| | | |
|---|---|---|
| MA 113 | College Algebra | 3 |
| BIO 154 | Human Body Systems | 4 |
| BIO 163 | Medical Terminology | 3 |

Other – 2 hrs.

| | | |
|---|---|---|
| EXS 102 | Lifetime Wellness | 2 |

Content Requirement - 52 hours

Required Courses - 43 hours

| | | |
|---|---|---|
| UE 101 | University Experience | 1 |

| | | |
|---|---|---|
| EXS 113 | Intro to Exercise Science | 3 |
| EXS 203 | Risk and Sports | 3 |
| EXS 263 | Motor Learning | 3 |
| EXS 273 | Nutrition | 3 |
| EXS 283 | Fitness Evaluation Assessment | 3 |
| EXS 293 | Biomechanics | 3 |
| EXS 323 | Performance Nutrition | 3 |
| EXS 333 | Kinesiology | 3 |
| EXS 343 | Principles of Human Performance | 3 |
| EXS 353 | Exercise Physiology | 3 |
| EXS 363 | Capstone Experience in Health Sciences I | 3 |
| EXS 373/AHS 373 | Health Promotion & Problems | 3 |
| EXS 383/AHS 383 | Health Coaching | 3 |
| EXS 483 | Professional Development in Exercise Science | 3 |

Exercise Science Electives - 9 hours

9 Exercise Science elective credits from the following: AHS 113, EXS 103, EXS 243, EXS 413, EXS 423, EXS 453, EXS 483 in Coaching, EXS 493, EXS 474, EXS 473.

Electives - 8 hrs

Elective hours determined in conjunction with advisor and based on graduate school preparation.

Occupational Therapy Required Courses – 38 hrs.

Occupational Therapy coursework is taken in the student's fourth year of study, which counts toward both degrees through credit sharing.

| | | |
|---|---|---|
| OTD 5111 | CARE I | 1 |
| OTD 5113 | Occupational Therapy Fundamentals | 3 |
| OTD 5123 | OT Theory & Behavioral Health | 3 |
| OTD 5133 | Innovations in Practice | 3 |
| OTD 5191 | Occupation Based Intervention 1 | 1 |
| OTD 5221 | CARE II | 1 |
| OTD 5222 | Principles of Documentation | 2 |
| OTD 5232 | Professional Development | 2 |
| OTD 5243 | Scholarly Inquiry & EBP I | 3 |
| OTD 5251 | Occupation-Based Intervention 2 | 1 |
| OTD 5253 | OT Theory & Pediatrics | 3 |
| OTD 5322 | Applied Physiology I | 2 |
| OTD 5331 | CARE III | 1 |
| OTD 5332 | Practice Design and Simulation | 2 |
| OTD 5333 | Movement & Occupational Analysis | 3 |
| OTD 5343 | Scholarly Inquiry and EBP II | 3 |
| OTD 5351 | Occupation-Based Intervention 3 | 1 |
| OTD 5353 | OT Theory & Adults | 3 |

## 3+3 Bachelor of Science in Psychology and a Doctor of Occupational Therapy

Note: Our other 3+3 programs do not have a description. We will review this over the summer.

**3+3 Degree Path for a Bachelor of Science in Psychology and a Doctor of Occupational Therapy**

General Education Requirements - 38 hours

Communication - 9 hrs.

| | | |
|---|---|---|
| ENG 143 | College Composition | 3 |
| HUM 203 | Humanities Seminar | 3 |
| SP 203 | Effective Speaking | 3 |

Humanities and Social Science - 12 hrs

| | | |
|---|---|---|
| PSY 113 | Principles of Psychology | 3 |
| POLS 113 | Introduction to Government | 3 |
| SOC 103 | Principles of Sociology | 3 |
| | Humanities | |

Mathematics and Science - 11 hrs

| | | |
|---|---|---|
| MA 253 | Statistics | 3 |
| BIO 114 | Principles of Biology I | 4 |
| BIO 204 | Fundamentals of Anatomy & Physiology I | 4 |

Other - 6 hrs.

| | | |
|---|---|---|
| HIS 103 | American History I | 3 |
| | Or | |
| HIS 203 | World Civilization I | 3 |
| | | |
| HIS 113 | American History II | 3 |
| | Or | |
| HIS 213 | World Civilization II | 3 |

Required - 7 hrs.

| | | |
|---|---|---|
| UE 101 | University Experience | 1 |
| PSY 303 | Research Methods in Psychology | 3 |
| | | |
| PSY 453 | Clinical Internship I | 3 |
| | Or | |
| PSY 473 | Psychology Capstone Demonstration | 3 |

Clinical Core Courses - 12 hrs

Choose four of the following clinical core courses.

| | | |
|---|---|---|
| PSY 323 | Abnormal Psychology | 3 |
| PSY 363/SOC 363 | Human Behavior & Counseling | 3 |
| PSY 403 | Human Sexuality | 3 |
| PSY 413 | The Psychology of Addiction | 3 |
| PSY 423 | Counseling Theories & Practices | 3 |

Cognitive Core Courses - 6 hrs.

Choose two of the following social/cognitive core courses.

| | | |
|---|---|---|
| PSY 333 | Psychology of Personality | 3 |
| PSY 343 | Social Psychology | 3 |
| PSY 373 | Political Psychology | 3 |

Developmental Core Courses - 6 hrs.

Choose two of the following developmental core courses.

| | | |
|---|---|---|
| PSY 223 | Life Span Developmental Psychology | 3 |
| PSY 353 | Child & Adolescent Psychology | 3 |
| SOC 323 | The Family | 3 |

Additional Psychology Core Electives - 18 hrs.

Choose 18 hours from any above subject area courses not used or from the list below.

| | | |
|---|---|---|
| PSY 313 | Topics in Psychology | 3 |
| PSY 383 | Forensic Psychology | 3 |
| PSY 433 | Issues of Substance Abuse in Family Systems | 3 |
| PSY 443 | Advanced Forensic Psychology | 3 |
| PSY 483 | Counseling Issues in Substance Abuse | 3 |
| PSY 493 | Issues & Ethics in Psychology & Counseling | 3 |
| SOC 313 | Topics in Sociology | 3 |
| SM 393 | Sport Psychology | 3 |

Occupational Therapy Required Courses - 38 hrs.

Occupational Therapy coursework is taken in the student's fourth year of study.

| | | |
|---|---|---|
| OTD 5111 | CARE I | 1 |
| OTD 5113 | Occupational Therapy Fundamentals | 3 |
| OTD 5123 | OT Theory & Behavioral Health | 3 |
| OTD 5133 | Innovations in Practice | 3 |
| OTD 5191 | Occupation Based Intervention 1 | 1 |
| OTD 5221 | CARE II | 1 |
| OTD 5222 | Principles of Documentation | 2 |
| OTD 5232 | Professional Development | 2 |
| OTD 5243 | Scholarly Inquiry & EBP I | 3 |
| OTD 5251 | Occupation-Based Intervention 2 | 1 |
| OTD 5253 | OT Theory & Pediatrics | 3 |
| OTD 5322 | Applied Physiology I | 2 |
| OTD 5331 | CARE III | 1 |
| OTD 5332 | Practice Design and Simulation | 2 |
| OTD 5333 | Movement & Occupational Analysis | 3 |
| OTD 5343 | Scholarly Inquiry and EBP II | 3 |
| OTD 5351 | Occupation-Based Intervention 3 | 1 |
| OTD 5353 | OT Theory & Adults | 3 |

# 3+3 Bachelor of Science in Biochemistry and a Master's of Physician Assistant Studies

**3+3 Degree Path for a Bachelor of Science in Biochemistry and a Master of Physician Assistant Studies**

Recommend Sequence of Courses

Freshman Fall – 18 hrs.

| | | |
|---|---|---|
| UE 101 | University Experience | 1 |
| MA 134 | Calculus I | 4 |
| CH 104 | General Chemistry I | 4 |
| ENG 133 | Technical Communication | 3 |
| | Or | |
| ENG 143 | College Composition | 3 |
| PSY 113 | Principles of Psychology | 3 |

| | | |
|---|---|---|
| SP 203 | Effective Speaking | 3 |
| | Or | |
| COM 163 | Interpersonal Communication | 3 |

Freshman Spring – 17 hrs.

| | | |
|---|---|---|
| BIO 163 | Medical Terminology | 3 |
| CH 114 | General Chemistry II | 4 |
| BIO 114 | Principles of Biology I | 4 |
| ENG 153 | Introduction to Literature | 3 |
| | Humanities or Social Science Elective | 3 |

Sophomore Fall – 18 hrs.

| | | |
|---|---|---|
| CH 204 | Organic Chemistry I | 4 |
| BIO 124 | Principles of Biology II | 4 |
| BIO 233 | Cell Biology | 3 |
| HUM 203 | Humanities Seminar | 3 |
| CH 234 | Quantitative Chemical Analysis | 4 |

Sophomore Spring – 17 hrs.

| | | |
|---|---|---|
| CH 214 | Organic Chemistry II | 4 |
| CH 202 | Introduction to Chemical Literature and Communication | 2 |
| BIO 324 | Microbiology | 4 |
| MA 253 | Statistics | 3 |
| CH 324 | Chemical Instrumental Analysis | 4 |

Junior Fall – 18 hrs.

| | | |
|---|---|---|
| BIO 384 | Human Anatomy & Physiology I | 4 |
| BIO 414 | Genetics | 4 |
| CH 302 | Professional Practice Science | 2 |
| CH 434 | Biochemistry I | 4 |
| SCI 434 | Science Internship | 4 |

Junior Spring – 16 hrs.

| | | |
|---|---|---|
| BIO 394 | Human Anatomy & Physiology II | 4 |
| CH 444/BIO 444 | Biochemistry II | 4 |
| BIO 364 | Toxicology | 4 |
| BIO 454 | Molecular Biology | 4 |

Not Pursuing the DPT Program – 16 hrs.

Courses to complete for Bachelor of Science – Biochemistry if not pursuing the MPAS Program

Senior Fall and Spring - 16 hrs.

| | | |
|---|---|---|
| | Electives (16) | 16 |

MPAS Program Acceptance - 35 hrs.

Courses to complete as part of the 1st year MPAS Program

MPAS Fall I – 17 hrs.

| | | |
|---|---|---|
| PAS 5004 | Clinical Anatomy | 4 |
| PAS 5012 | Clinical Skills I: Medical Documentation and Interviewing | 2 |
| PAS 5014 | Clinical Physiology | 4 |
| PAS 5022 | Physician Assistant Professional Practice | 2 |

| | | |
|---|---|---|
| PAS 5052 | Clinical Application and Reflection Experience I | 2 |
| PAS 5213 | Diagnostic Techniques - Imaging | 3 |

MPAS Spring I – 18 hrs.

| | | |
|---|---|---|
| PAS 5102 | Clinical Skills II: Physical Exam | 2 |
| PAS 5110 | Clinical Medicine and Therapeutics I | 10 |
| PAS 5152 | Clinical Application and Reflection Experience II | 2 |
| PAS 5161 | Clinical Pharmacology I | 1 |
| PAS 5171 | Evidence Based Practice I | 1 |
| PAS 5122 | Clinical Genetics | 2 |

# 3+3 Bachelor of Science in Biology and a Master's Physician Assistant Studies

**3+3 Degree Path for a Bachelor of Science in Biology and a Master of Physician Assistant Studies**

Recommend Sequence of Courses

Freshman Fall – 17 hrs.

| | | |
|---|---|---|
| UE 101 | University Experience | 1 |
| MA 113 | College Algebra | 3 |
| BIO 114 | Principles of Biology I | 4 |
| ENG 133 | Technical Communication | 3 |
| | Or | |
| ENG 143 | College Composition | 3 |
| PSY 113 | Principles of Psychology | 3 |
| SP 203 | Effective Speaking | 3 |
| | Or | |
| COM 163 | Interpersonal Communication | 3 |

Freshman Spring – 17 hrs.

| | | |
|---|---|---|
| MA 123 | Trigonometry | 3 |
| CH 104 | General Chemistry I | 4 |
| BIO 124 | Principles of Biology II | 4 |
| HUM 203 | Humanities Seminar | 3 |
| BIO 163 | Medical Terminology | 3 |

Sophomore Fall – 18 hrs.

| | | |
|---|---|---|
| BIO 233 | Cell Biology | 3 |
| BIO 274 | General Ecology | 4 |
| CH 114 | General Chemistry II | 4 |
| ENG 153 | Introduction to Literature | 3 |
| PH 154 | College Physics I | 4 |

Sophomore Spring – 17 hrs.

| | | |
|---|---|---|
| CH 204 | Organic Chemistry I | 4 |
| BIO 202 | Introduction to Biological Literature & Communication | 2 |
| BIO 324 | Microbiology | 4 |
| PH 164 | College Physics II | 4 |
| | PA Specific Biology Elective (3) | 3 |

Junior Fall – 18 hrs.

| | | |
|---|---|---|
| BIO 384 | Human Anatomy & Physiology I | 4 |
| BIO 414 | Genetics | 4 |
| BIO 302 | Professional Practice in Science | 2 |
| BIO 434 | Biochemistry I | 4 |
| | Natural Science Biology Elective | 4 |

Junior Spring – 18 hrs.

| | | |
|---|---|---|
| BIO 394 | Human Anatomy & Physiology II | 4 |
| | Humanities or Social Science Elective | 3 |
| MA 253 | Statistics | 3 |
| SCI 434 | Science Internship | 4 |
| | PA Specific Biology Elective (3) | 3 |

Not Pursuing the MPAS Program – 15 hrs.

Courses to complete for Bachelor of Science – Biology if not pursuing the MPAS Program

Senior Fall and Spring - 15 hrs.

| | | |
|---|---|---|
| | Electives (15) | 15 |

MPAS Program Acceptance – 35 hrs.

Courses to complete as part of the 1st year MPAS Program

MPAS Fall I – 17 hrs.

| | | |
|---|---|---|
| PAS 5004 | Clinical Anatomy | 4 |
| PAS 5012 | Clinical Skills I: Medical Documentation and Interviewing | 2 |
| PAS 5014 | Clinical Physiology | 4 |
| PAS 5022 | Physician Assistant Professional Practice | 2 |
| PAS 5052 | Clinical Application and Reflection Experience I | 2 |
| PAS 5213 | Diagnostic Techniques - Imaging | 3 |

MPAS Spring I – 18 hrs.

| | | |
|---|---|---|
| PAS 5102 | Clinical Skills II: Physical Exam | 2 |
| PAS 5110 | Clinical Medicine and Therapeutics I | 10 |
| PAS 5122 | Clinical Genetics | 2 |
| PAS 5152 | Clinical Application and Reflection Experience II | 2 |
| PAS 5161 | Clinical Pharmacology I | 1 |
| PAS 5171 | Evidence Based Practice I | 1 |

## 3+3 Bachelor of Science in Biology and a Doctorate of Physical Therapy

**3+3 Degree Path for a Bachelor of Science in Biology and A Doctorate in Physical Therapy**

Recommend Sequence of Courses

Freshman Fall – 17 hrs.

| | | |
|---|---|---|
| UE 101 | University Experience | 1 |
| ENG 133 | Technical Communication | 3 |
| | Or | |
| ENG 143 | College Composition | 3 |

| | | |
|---|---|---|
| BIO 114 | Principles of Biology I | 4 |
| MA 113 | College Algebra | 3 |
| PSY 113 | Principles of Psychology | 3 |
| | | |
| COM 163 | Interpersonal Communication | 3 |
| | Or | |
| SP 203 | Effective Speaking | 3 |

Freshman Spring – 17 hrs.

| | | |
|---|---|---|
| BIO 124 | Principles of Biology II | 4 |
| HUM 203 | Humanities Seminar | 3 |
| MA 123 | Trigonometry | 3 |
| CH 104 | General Chemistry I | 4 |
| MA 253 | Statistics | 3 |

Sophomore Fall – 18 hrs.

| | | |
|---|---|---|
| BIO 233 | Cell Biology | 3 |
| BIO 274 | General Ecology | 4 |
| CH 114 | General Chemistry II | 4 |
| ENG 153 | Introduction to Literature | 3 |
| PH 154 | College Physics I | 4 |

Sophomore Spring – 17 hrs.

| | | |
|---|---|---|
| CH 204 | Organic Chemistry I | 4 |
| BIO 202 | Introduction to Biological Literature & Communication | 2 |
| BIO 324 | Microbiology | 4 |
| | Biology Elective (3) | 3 |
| PH 164 | College Physics II | 4 |

Junior Fall – 18 hrs.

| | | |
|---|---|---|
| BIO 384 | Human Anatomy & Physiology I | 4 |
| BIO 414 | Genetics | 4 |
| BIO 302 | Professional Practice in Science | 2 |
| | Natural Science Biology Elective | 4 |
| | Chemistry or Math Electives (4) | 4 |

Junior Spring – 18 hrs.

| | | |
|---|---|---|
| BIO 394 | Human Anatomy & Physiology II | 4 |
| ENG 453 | Advanced Composition | 3 |
| BIO 364 | Toxicology | 4 |
| SCI 434 | Science Internship | 4 |
| | Humanities or Social Science Elective | 3 |

Not Pursuing the DPT Program – 15 hrs.

Courses to complete for Bachelor of Science – Biology if not pursuing the DPT Program

Senior Fall and Spring - 15 hrs.

| | | |
|---|---|---|
| | Electives (15) | 15 |

DPT Program Acceptance – 24 hrs.

Courses to complete as part of the 1st year DPT Program

DPT Fall I – 12 hrs.

| | | |
|---|---|---|
| DPT 5111 | CARE I | 1 |
| DPT 5124 | Anatomy of Movement I | 4 |
| DPT 5134 | Applied Physiology I | 4 |
| DPT 5143 | Clinical Practice I | 3 |

DPT Spring I – 12 hrs.

| | | |
|---|---|---|
| DPT 5224 | Anatomy of Movement II | 4 |
| DPT 5234 | Applied Physiology II | 4 |
| DPT 5254 | Applied Neuroscience | 4 |

## 3+3 Bachelor of Science in Exercise Science and a Doctorate of Physical Therapy

**3+ 3 Degree Path for a Bachelor of Science in Exercise Science and a Doctorate in Physical Therapy**

Recommend Sequence of Courses

Freshman Fall – 16 hrs.

| | | |
|---|---|---|
| BIO 114 | Principles of Biology I | 4 |
| ENG 133 | Technical Communication | 3 |
| | Or | |
| ENG 143 | College Composition | 3 |
| EXS 102 | Lifetime Wellness | 2 |
| EXS 273 | Nutrition | 3 |
| MA 113 | College Algebra | 3 |
| UE 101 | University Experience | 1 |

Freshman Spring – 16 hrs.

| | | |
|---|---|---|
| BIO 124 | Principles of Biology II | 4 |
| MA 123 | Trigonometry | 3 |
| EXS 263 | Motor Learning | 3 |
| HUM 203 | Humanities Seminar | 3 |
| PSY 113 | Principles of Psychology | 3 |

Sophomore Fall – 16 hrs.

| | | |
|---|---|---|
| CH 104 | General Chemistry I | 4 |
| SP 203 | Effective Speaking | 3 |
| MA 253 | Statistics | 3 |
| EXS 283 | Fitness Evaluation Assessment | 3 |
| EXS 293 | Biomechanics | 3 |

Sophomore Spring – 16 hrs.

| | | |
|---|---|---|
| CH 114 | General Chemistry II | 4 |
| EXS 353 | Exercise Physiology | 3 |
| EXS 373/AHS 373 | Health Promotion & Problems | 3 |
| | Humanities Elective (3) | 3 |
| | Psychology Elective | 3 |

Junior Fall – 17 hrs.

| | | |
|---|---|---|
| BIO 384 | Human Anatomy & Physiology I | 4 |
| ENG 453 | Advanced Composition | 3 |
| EXS 333 | Kinesiology | 3 |
| EXS 483 | Professional Development in Exercise Science | 3 |

| | | |
|---|---|---|
| PH 154 | College Physics I | 4 |

Junior Spring – 14 hrs.

| | | |
|---|---|---|
| BIO 394 | Human Anatomy & Physiology II | 4 |
| EXS 383/AHS 383 | Health Coaching | 3 |
| EXS 423 | Evaluation of Athletic Injuries | 3 |
| PH 164 | College Physics II | 4 |

Not Pursuing the DPT Program – 25 hrs.

Courses to complete for a Bachelor of Science in Exercise Science if not pursuing the DPT Program

Senior Fall and Spring - 25 hrs.

| | | |
|---|---|---|
| | Electives (25) | 25 |

DPT Program Acceptance – 33 hrs.

Courses to complete as part of the 1st year DPT Program.

DPT Fall I – 16 hrs.

| | | |
|---|---|---|
| DPT 5111 | CARE I | 1 |
| DPT 5124 | Anatomy of Movement I | 4 |
| DPT 5134 | Applied Physiology I | 4 |
| DPT 5143 | Clinical Practice I | 3 |
| DPT 5152 | Health Behavior Science | 2 |
| DPT 5162 | Professional Development I | 2 |

DPT Spring I – 17 hrs.

| | | |
|---|---|---|
| DPT 5211 | CARE II | 1 |
| DPT 5224 | Anatomy of Movement II | 4 |
| DPT 5234 | Applied Physiology II | 4 |
| DPT 5241 | Cardiopulmonary PT I | 1 |
| DPT 5243 | Clinical Practice II | 3 |
| DPT 5254 | Applied Neuroscience | 4 |

# Professional Tracks

The Department of Exercise Science also helps to coordinate the following program:

- PRE-MED PROFESSIONAL TRACK
- PRE-PHYSICAL THERAPY PROFESSIONAL TRACK

## Pre-Med Professional Track - 51-53 Hours

The Pre-Med Professional Track can be associated with any major offered at Trine University and is designed for students interested in preparing themselves for a career in health sciences. In conjunction with, or in addition to, the curricular requirements of the major, the Pre-Med Professional Track requires the below coursework.

To be a competitive Medical School Applicant, students in the track must achieve at least a “B+” grade in all science courses listed above. Honors courses are highly recommended. Students must maintain a GPA of 3.5 or better to remain in the pre-med track. Students meet regularly with the Pre-Health advisor to assess readiness for the medical school application process.

**Requirements 51-53 hrs**

Requirements – 51-53 hrs.

| | | |
|---|---|---|
| BIO 114 | Principles of Biology I | 4 |
| BIO 124 | Principles of Biology II | 4 |
| | Or | |
| BIO 233 | Cell Biology | 3 |
| CH 104 | General Chemistry I | 4 |
| | And | |
| CH 114 | General Chemistry II | 4 |
| CH 204 | Organic Chemistry I | 4 |
| CH 214 | Organic Chemistry II | 4 |
| CH 434 | Biochemistry I | 4 |
| MA 134 | Calculus I | 4 |
| MA 253 | Statistics | 3 |
| PH 154 | College Physics I | 4 |
| | And | |
| PH 164 | College Physics II | 4 |
| | Or | |
| PH 224 | University Physics I | 4 |
| | And | |
| PH 234 | University Physics II | 4 |
| PSY 113 | Principles of Psychology | 3 |
| SOC 103 | Principles of Sociology | 3 |
| PHL 313 | Ethics | 3 |

## Pre-Physical Therapy Professional Track - 41 hours

**Requirements - 41 Hours**

The Pre-Physical Therapy Professional Track can be associated with any major offered at Trine University, though majors in the School of Health Sciences provide the clearest path to successful entry into a Doctor of Physical Therapy degree program. In conjunction with, or in addition to, the curricular requirements of the major, the Pre-Physical Therapy Professional Track requires the below coursework.

Students must also maintain a cumulative GPA of 3.5 or better to stay in the track. They are evaluated during their final year via benchmark interviews that address the following characteristics of a successful physical therapy program applicant: development of personal and professional qualities; physical therapy or graduate school applications; and community service, clinical observation and leadership experiences.

Requirements – 41 hrs.

| | | |
|---|---|---|
| BIO 384 | Human Anatomy & Physiology I | 4 |
| BIO 394 | Human Anatomy & Physiology II | 4 |
| | Biological Sciences | 8 |
| CH 104 | General Chemistry I | 4 |
| CH 114 | General Chemistry II | 4 |
| ENG 453 | Advanced Composition | 3 |
| MA 253 | Statistics | 3 |
| PH 154 | College Physics I | 4 |
| | And | |

| | | |
|---|---|---|
| PH 164 | College Physics II | 4 |
| | Or | |
| PH 224 | University Physics I | 4 |
| | And | |
| PH 234 | University Physics II | 4 |
| | | |
| | Psychology Elective | 3 |

*Biological Sciences: excluding botany & zoology*

# College of Health Professions

**The College of Health Professions offers the following degrees:**

ASSOCIATE DEGREES:

- ASSOCIATE OF APPLIED SCIENCE IN SURGICAL TECHNOLOGY
- ASSOCIATE OF SCIENCE IN NURSING

BACHELOR OF SCIENCE IN:

- NURSING (ONLINE)

GRADUATE PROGRAMS:

- CERTIFICATE OF NURSING EDUCATION
- NURSING INFORMATICS CERTIFICATE
- MASTER OF SCIENCE IN NURSING
- MASTER OF PHYSICIAN ASSISTANT STUDIES
- DOCTOR OF PHYSICAL THERAPY
- DOCTORATE OF OCCUPATIONAL THERAPY

**Mission**
The College of Health Professions at Trine University, by providing high quality, professionally focused and formative undergraduate and graduate science learning opportunities, enable its students, graduates and faculty to make a positive impact on the community through service, leadership, and scholarship.

The College of Health Professions, located in the growing Trine University Fort Wayne education center on the Parkview Hospital Randalia campus in Fort Wayne, Indiana, offers degrees essential to the future of healthcare. As a student in this college, you will experience state-of-the art laboratories, top-of-the-line classroom technology and expert faculty dedicated to your success. Trine University has partnerships and clinical agreements with established health systems in northeastern Indiana including Parkview Health System and Lutheran Health Network, which allows for real-world clinical education experiences.

The diverse programs within the College of Health Professions allow students to experience collaboration with those in different medical fields. Graduate programs in the College of Health Professions offer direct entry options for students in Trine's Rinker-Ross School of Health Sciences on the Angola campus.

## Associate of Science in Nursing

The ASN program is designed to educate entry-level registered nurses as generalists for practice. Students enrolled in the ASN program will be required to participate in lectures, clinical lab, and clinical experiences within the curriculum.

**Mission**

The Associate of Science in Nursing (ASN) Program at Trine University will provide a quality, innovative educational experience that produces entry-level nursing graduates capable of delivering safe, culturally and contextually relevant, evidence-based care in a variety of environments, while also preparing them to positively impact individuals, groups, and communities through scholarship, leadership, and service.

**Outcomes**

Student Learning Outcomes (SLOs)
By the end of the program, the student will be able to meet the outcomes expected of the Core Competencies for Professional Nursing Education Achievement for the entry-level professional nurse. The accomplishment of such will enable graduates to practice within the healthcare systems and assume the roles: provider of care; designer, manager, and coordinator of care; and member of a profession (AACN, 2021):

Domain 1: Knowledge for Nursing Practice
Descriptor: Integration, translation, and application of established and evolving disciplinary nursing knowledge and ways of knowing, as well as knowledge from other disciplines, including a foundation in liberal arts and natural and social sciences. This distinguishes the practice of professional nursing and forms the basis for clinical judgment and innovation in nursing practice.

Competencies:
1.1 Demonstrate an understanding of the discipline of nursing's distinct perspective and where shared perspectives exist with other disciplines.
1.2 Apply theory and research-based knowledge from nursing, the arts, humanities, and other sciences.
1.3 Demonstrate clinical judgement founded on a broad knowledge base.

Domain 2: Person-Centered Care
Descriptor: Person-centered care focuses on the individual within multiple complicated contexts, including family and/or important others. Person-centered care is holistic, individualized, just, respectful, compassionate, coordinated, evidence-based, and developmentally appropriate. Person-centered care builds on a scientific body of knowledge that guides nursing practice regardless of specialty or functional area.

Competencies:
2.1 Engage with the individual in establishing a caring relationship.
2.2 Communicate effectively with individuals.
2.3 Integrate assessment skills in practice.
2.4 Diagnose actual or potential health problems and needs.
2.5 Develop plans of care.
2.6 Demonstrate accountability for care delivery.
2.7 Evaluate outcomes of care.
2.8 Promote self-care management.
2.9 Provide care coordination.

Domain 3: Population Health
Descriptor: Population health spans the healthcare delivery continuum from public health prevention to disease management of populations and describes collaborative activities with both traditional and non-traditional partnerships from affected communities, public health, industry, academia, health care, local government entities, and others for the improvement of equitable population health outcomes.

Competencies:
3.1 Manage population health.
3.2 Engage in effective partnerships.
3.3 Consider the socioeconomical impact of the delivery of health care.
3.4 Advance equitable population health policy.
3.5 Demonstrate advocacy strategies.

3.6 Advance preparedness to protect population health during disasters and public health emergencies.

Domain 4: Scholarship for Nursing Practice
Descriptor: The generation, synthesis, translation, application, and dissemination of nursing knowledge to improve health and transform health care.

Competencies:
4.1 Advance the scholarship of nursing.
4.2 Integrate best evidence into nursing practice.
4.3 Promote the ethical conduct of scholarly activities.

Domain 5: Quality and Safety
Descriptor: Employment of established and emerging principles of safety and improvement science. Quality and safety, as core values of nursing practice, enhance quality and minimize risk of harm to patients and providers through both system effectiveness and individual performance.

Competencies:
a. Apply quality improvement principles in care delivery.
b. Contribute to a culture of patient safety.
c. Contribute to a culture of provider and work environment safety.

Domain 6: Interprofessional Partnerships
Descriptor: Intentional collaboration across professions and with care team members, patients, families, communities, and other stakeholders to optimize care, enhance the healthcare experience, and strengthen outcomes.

Competencies:
6.1 Communicate in a manner that facilitates a partnership approach to quality care delivery.
6.2 Perform effectively inn different team roles, using principles and values of team dynamics.
6.3 Use knowledge of nursing and other professions to address healthcare needs.
6.4 Work with other professions to maintain a climate of mutual learning, respect, and shared values.

Domain 7: Systems-Based Practice
Descriptor: Responding to and leading within complex systems of health care. Nurses effectively and proactively coordinate resources to provide safe, quality, equitable care to diverse populations.

Competencies:
7.1 Apply knowledge of systems to work effectively across the continuum of care.
7.2 Incorporate consideration of cost-effectiveness of care.
7.3 Optimize system effectiveness through application of innovation and evidence-based practice.

Domain 8: Information and Healthcare Technologies
Descriptor: Information and communication technologies and informatics processes are used to provide care, gather data, form information to drive decision making, and support professionals as they expand knowledge and wisdom for practice. Informatics processes and technologies are used to manage and improve the delivery of safe, high-quality, and efficient healthcare services in accordance with best practice and

professional and regulatory standards.

Competencies:
8.1 Describe the various information and communication technology tools used in the care of patients, communities, and populations.
8.2 Use information and communication technology to gather data, create information and generate knowledge.
8.3 Use information and communication technologies and informatics processes to deliver safe nursing care to diverse populations in a variety of settings.
8.4 Use information and communication technology to support documentation of care and communication among providers, patients, at all system levels.
8.5 Use information and communication technologies in accordance with ethical, legal, professional, and regulatory standards, and workplace policies in the delivery of care.

Domain 9: Professionalism
Descriptor: Formation and cultivation of a sustainable professional nursing identity, accountability, perspective, collaborative disposition, and comportment that reflects nursing's characteristics and values.

Competencies:
9.1 Demonstrate an ethical comportment in one's practice reflective of nursing's mission to society.
9.2 Employ participatory approach to nursing care.
9.3 Demonstrate accountability to the individual, society, and the profession.
9.4 Comply with relevant laws, policies, and regulations.
9.5 Demonstrate the professional identity of nursing.
9.6 Integrate diversity, equity, and inclusion as core to one's professional identity.

Domain 10: Personal, Professional, and Leadership Development
Descriptor: Participation in activities and self-reflection that foster personal health, resilience, and well-being, lifelong learning, and support the acquisition of nursing expertise and assertion of leadership.

Competencies:
10.1 Demonstrate a commitment to personal health and well-being.
10.2 Demonstrate a spirit of inquiry that fosters flexibility and professional maturity.
10.3 Develop capacity for leadership.

American Association of Colleges of Nursing [AACN], (2021). The essentials: Core competencies for professional nursing education. Washington, DC: Author.

**Degree Requirements**

General Education Requirements (29 Credits)

| | | |
|---|---|---|
| ENG 143 | College Composition | 3 |
| COM 163 | Interpersonal Communication | 3 |
| | Or | |
| SP 203 | Effective Speaking | 3 |
| PSY 113 | Principles of Psychology | 3 |
| SOC 103 | Principles of Sociology | 3 |

| | | |
|---|---|---|
| BIO 204 | Fundamentals of Anatomy & Physiology I | 4 |
| BIO 224 | Fundamentals of Anatomy & Physiology II | 4 |
| BIO 123 | Microbiology for Health Science | 3 |
| CH 1003 | Fundamentals of Chemistry | 3 |
| | Mathematics Elective (3) | 3 |

Nursing Core Requirements (36 Credits)

| | | |
|---|---|---|
| NRS 102 | Nursing Fundamentals | 2 |
| NRS 103 | Nursing Fundamentals Lab | 3 |
| NRS 113 | Pharmacology for Nurses | 3 |
| NRS 122 | Adult Nursing I Clinical | 2 |
| NRS 123 | Adult Nursing I | 3 |
| NRS 132 | Adult Nursing II Clinical | 2 |
| NRS 133 | Adult Nursing II | 3 |
| NRS 201 | Women's Health & Childbirth Lab | 1 |
| NRS 202 | Women's Health & Childbirth | 2 |
| NRS 211 | Women's Health & Childbirth Clinical | 1 |
| NRS 221 | Pediatric Lab | 1 |
| NRS 222 | Pediatric Nursing | 2 |
| NRS 231 | Pediatric Clinical | 1 |
| NRS 241 | Mental Health Nursing Clinical | 1 |
| NRS 242 | Mental Health Nursing | 2 |
| NRS 252 | Advanced Care for Adults Clinical | 2 |
| NRS 253 | Advanced Care for Adults | 3 |
| NRS 261 | Nursing Capstone - NCLEX Prep | 1 |
| NRS 251 | Advanced Care for Adults Lab | 1 |

## Associate of Applied Science in Surgical Technology (71 Hrs.)

The program is located in the Health Sciences Education Center at the Carew Street Campus.

**Degree Requirements**

Recommend Sequence of Courses for a total of 71 Hours

Fall Year 1 – 18 hrs.

| | | |
|---|---|---|
| ENG 133 | Technical Communication | 3 |
| | Or | |
| ENG 143 | College Composition | 3 |
| HS 104 | Anatomy & Physiology I for Applied Science Majors | 4 |
| BIO 163 | Medical Terminology | 3 |
| SUR 104 | Introduction to Surgical Technology | 4 |
| SUR 114 | Clinical Experience I | 4 |

Spring Year 1 – 18 hrs.

| | | |
|---|---|---|
| HS 114 | Anatomy & Physiology II for Applied Science Majors | 4 |
| BIO 123 | Microbiology for Health Science | 3 |
| SUR 134 | Surgical Procedure I | 4 |
| SUR 124 | Clinical Experience II | 4 |

Complete one of the following:

| | | |
|---|---|---|
| HUM 203 | Humanities Seminar | 3 |

| | | |
|---|---|---|
| COM 163 | Interpersonal Communication | 3 |
| COM 213 | Business Communication | 3 |
| SP 203 | Effective Speaking | 3 |

Summer Year 1 – 17 hrs.

| | | |
|---|---|---|
| BIO 212 | Pharmacology for Surgical Technologist | 2 |
| SUR 234 | Surgical Procedures II | 4 |
| SUR 218 | Clinical Experience III | 8 |
| PSY 113 | Principles of Psychology | 3 |

Fall Year 2 – 18 hrs.

| | | |
|---|---|---|
| SUR 244 | Surgical Procedures III | 4 |
| SUR 228 | Clinical Experience IV | 8 |
| SUR 223 | Capstone for the Surgical Technologist | 3 |
| MA 113 | College Algebra | 3 |

## Bachelor of Science in Nursing (120 hrs.)

The RN-BSN Program at Trine University will provide a quality, innovative educational experience that produces professional nursing graduates capable of delivering safe, culturally and contextually relevant, evidence-based care in a variety of environments, while also preparing graduates to positively impact individuals, groups, and communities through scholarship, leadership, and service.

The RN-BSN program is designed for Associate degree registered nurses as an educational bridge that leads to a baccalaureate degree in nursing. Students enrolled in the RN-BSN program will be required to participate in two clinical education experiences in addition to online coursework within the curriculum.

**Degree Requirements**

General Education Requirements - 32 hours

Communication – 9 hrs.

| | | |
|---|---|---|
| ENG 143 | College Composition | 3 |
| HUM 203 | Humanities Seminar | 3 |
| COM 163 | Interpersonal Communication | 3 |
| | Or | |
| SP 203 | Effective Speaking | 3 |

Humanities and Social Science – 9 hrs.

| | | |
|---|---|---|
| | Humanities Elective (3) | 3 |
| | Social Science Elective (3) | 3 |
| | Social Sciences or Humanities elective | 3 |

Mathematics and Science –11 hrs.

| | | |
|---|---|---|
| | Math Elective | 3 |
| BIO 204 | Fundamentals of Anatomy & Physiology I | 4 |
| BIO 224 | Fundamentals of Anatomy & Physiology II | 4 |

Other – 3 hrs.

| | | |
|---|---|---|
| | General Education Electives (3) | 3 |

Content Requirements - 35 hours

Required

| | | |
|---|---|---|
| NRS 303 | Professional Nursing Role | 3 |

| | | |
|---|---|---|
| NRS 313 | Transcultural Nursing | 3 |
| NRS 333 | Nursing Ethics | 3 |
| NRS 343 | Nursing Informatics | 3 |
| NRS 353 | Health Promotion Over Lifespan | 3 |
| NRS 414 | Community-Public Health Nursing | 4 |
| NRS 423 | Biostatistics & Epidemiology | 3 |
| NRS 433 | Foundations of Research | 3 |
| NRS 443 | Global Health | 3 |
| NRS 453 | Nursing Leadership & Management | 3 |
| NRS 484 | Professional Capstone Project | 4 |

Additional Requirements - 53 hours

Required

| | | |
|---|---|---|
| UE 111 | Online Learning Orientation | 1 |
| | Electives (16) | 16 |
| | Pre-Licensure Nursing Care | 36 |

## Certificate in Nursing Education (12 hrs.)

The Certificate of Nursing Education is designed to provide additional professional development opportunity for registered nurses interested or engaged in nurse preceptor, clinical educator, or academic nurse educator roles. This certificate would be available to nurses that possess a minimum of a baccalaureate degree in nursing. Should the BSN nurse wish to purse the master's degree of nursing (MSN) at Trine within three years of completion of the certificate, credit for these courses will be awarded as part of the MSN program after successful completion of NRS 5101. The Certificate of Nursing Education additional prepares graduates for the Certified Nurse Educator CNE® exam, which is administered through the National League for Nursing.

**Note:** Pending accreditation approval of the Master of Science in Nursing

**Certificate of Nursing Education (12 hrs.)**

Program Requirements

| | | |
|---|---|---|
| NRS 6213 | Curriculum Design in Nursing | 3 |
| NRS 6223 | Nursing Course Development | 3 |
| NRS 6233 | Teaching Strategies in Nursing | 3 |
| NRS 6243 | Assessment & Evaluation | 3 |

## Nursing Informatics Certificate

This certificate would be available to nurses that possess a minimum of a baccalaureate degree in nursing (BSN) and be comprised of the following courses: NRS 6313, NRS 6323, NRS 6333, and NRS 6343. Should the BSN nurse wish to pursue the master’s degree of nursing (MSN) at Trine within three years after completion of the certificate, credit for those four courses will be awarded after successful completion of NRS 5101 of the MSN program.

**Certificate of Nursing Informatics (12 hrs.)**

Program Requirements

| | | |
|---|---|---|
| NRS 6313 | Foundations in Nursing Informatics | 3 |
| NRS 6323 | Data Management in Healthcare | 3 |
| NRS 6333 | SDLC & Project Management | 3 |
| NRS 6343 | Evaluation Methods: Informatics | 3 |

# Master of Science in Nursing (35 hrs.)

**Program Mission**

The Master of Science in Nursing (MSN) program at Trine University will provide a quality, innovative educational experience that produces graduate nurses capable of delivering safe, culturally and contextually relevant, evidence-based care, education, and leadership in a variety of environments while also preparing them to positively impact individuals, groups, and communities through scholarship, leadership, and service.

**Outcomes**
**Student Learning Outcomes**

**Domain 1: Knowledge for Nursing Practice**

Descriptor: *Integration, translation, and application of established and evolving disciplinary nursing knowledge and ways of knowing, as well as knowledge from other disciplines, including a foundation in liberal arts and natural and social sciences. This*

*distinguishes the practice of professional nursing and forms the basis for clinical judgment and innovation in nursing practice.*

Competencies:

1.1 Demonstrate an understanding of the discipline of nursing's distinct perspective and where shared perspectives exist with other disciplines.

1.2 Apply theory and research-based knowledge from nursing, the arts, humanities, and other sciences.

1.3 Demonstrate clinical judgement founded on a broad knowledge base.

**Domain 2: Person-Centered Care**

*Descriptor: Person-centered care focuses on the individual within multiple complicated contexts, including family and/or important others. Person-centered care is holistic, individualized, just, respectful, compassionate, coordinated, evidence-based, and*

*developmentally appropriate. Person-centered care builds on a scientific body of knowledge that guides nursing practice regardless of specialty or functional area.*

Competencies:

2.1 Engage with the individual in establishing a caring relationship.

2.2 Communicate effectively with individuals.

2.3 Integrate assessment skills in practice.

2.4 Diagnose actual or potential health problems and needs.

2.5 Develop plans of care.

2.6 Demonstrate accountability for care delivery.

2.7 Evaluate outcomes of care.

2.8 Promote self-care management.

2.9 Provide care coordination.

**Domain 3: Population Health**

*Descriptor: Population health spans the healthcare delivery continuum from public health prevention to disease management of populations and describes collaborative activities with both traditional and non-traditional partnerships from affected communities, public health, industry, academia, health care, local government entities, and others for the improvement of equitable population health outcomes.*

Competencies:

3.1 Manage population health.

3.2 Engage in effective partnerships.

3.3 Consider the socioeconomical impact of the delivery of health care.

3.4 Advance equitable population health policy.

3.5 Demonstrate advocacy strategies.

3.6 Advance preparedness to protect population health during disasters and public health emergencies.

**Domain 4: Scholarship for Nursing Practice**

*Descriptor: The generation, synthesis, translation, application, and dissemination of nursing knowledge to improve health and transform health care.*

Competencies:

4.1 Advance the scholarship of nursing.

4.2 Integrate best evidence into nursing practice.

4.3 Promote the ethical conduct of scholarly activities.

**Domain 5: Quality and Safety**

*Descriptor: Employment of established and emerging principles of safety and improvement science. Quality and safety, as core values of nursing practice, enhance quality and minimize risk of harm to patients and providers through both system effectiveness and individual performance.*

Competencies:

a. Apply quality improvement principles in care delivery.

b. Contribute to a culture of patient safety.

c. Contribute to a culture of provider and work environment safety.

**Domain 6: Interprofessional Partnerships**

*Descriptor: Intentional collaboration across professions and with care team members, patients, families, communities, and other stakeholders to optimize care, enhance the healthcare experience, and strengthen outcomes.*

Competencies:

6.1 Communicate in a manner that facilitates a partnership approach to quality care delivery.

6.2 Perform effectively inn different team roles, using principles and values of team dynamics.

6.3 Use knowledge of nursing and other professions to address healthcare needs.

6.4 Work with other professions to maintain a climate of mutual learning, respect, and shared values.

**Domain 7: Systems-Based Practice**

*Descriptor: Responding to and leading within complex systems of health care. Nurses effectively and proactively coordinate resources to provide safe, quality, equitable care to diverse populations.*

Competencies:

7.1 Apply knowledge of systems to work effectively across the continuum of care.

7.2 Incorporate consideration of cost-effectiveness of care.

7.3 Optimize system effectiveness through application of innovation and evidence-based practice.

**Domain 8: Information and Healthcare Technologies**

*Descriptor: Information and communication technologies and informatics processes are used to provide care, gather data, form information to drive decision making, and support professionals as they expand knowledge and wisdom for practice. Informatics processes and technologies are used to manage and improve the delivery of safe, high quality, and efficient healthcare services in accordance with best practice and professional and regulatory standards.*

Competencies:

8.1 Describe the various information and communication technology tools used in the care of patients, communities, and populations.

8.2 Use information and communication technology to gather data, create information, and generate knowledge.

8.3 Use information and communication technologies and informatics processes to deliver safe nursing care to diverse populations in a variety of settings.

8.4 Use information and communication technology to support documentation of care and communication among providers, patients, an all system levels.

8.5 Use information and communication technologies in accordance with ethical, legal, professional, and regulatory standards, and workplace policies in the delivery of care.

**Domain 9: Professionalism**

*Descriptor: Formation and cultivation of a sustainable professional nursing identity, accountability, perspective, collaborative disposition, and comportment that reflects nursing's characteristics and values.*

Competencies:

9.1 Demonstrate an ethical comportment in one's practice reflective of nursing's mission to society.

9.2 Employ participatory approach to nursing care.

9.3 Demonstrate accountability to the individual, society, and the profession.

9.4 Comply with relevant laws, policies, and regulations.

9.5 Demonstrate the professional identity of nursing.

9.6 Integrate diversity, equity, and inclusion as core to one's professional identity.

**Domain 10: Personal, Professional, and Leadership Development**

*Descriptor: Participation in activities and self-reflection that foster personal health, resilience, and well-being, lifelong learning, and support the acquisition of nursing expertise and assertion of leadership.*

Competencies:

10.1 Demonstrate a commitment to personal health and well-being.

10.2 Demonstrate a spirit of inquiry that fosters flexibility and professional maturity.

10.3 Develop capacity for leadership.

**Accreditation**

The Master of Science in Nursing will apply for accreditation with The National League for Nursing Commission for Nursing Education Accreditation (CNEA). Additional accreditation information can be found at https://cnea.nln.org/

**Degree Requirements**

Nursing Core - 19 hours

Requirements

| | | |
|---|---|---|
| NRS 5101 | Transition to Graduate Nursing | 1 |
| NRS 5202 | Theoretical Foundations in NRS | 2 |
| NRS 5303 | Research for Evidence-based Prac | 3 |
| NRS 5313 | Statistics for Nursing Research | 3 |
| NRS 5314 | Advanced Care Coordination | 4 |
| NRS 5324 | Advanced Nursing Assessment | 4 |
| NRS 6902 | Graduate Nurse Capstone | 2 |

Specialization Track 16 hours

Nurse Educator Specialization Track

| | | |
|---|---|---|
| NRS 6213 | Curriculum Design in Nursing | 3 |
| NRS 6223 | Nursing Course Development | 3 |
| NRS 6233 | Teaching Strategies in Nursing | 3 |
| NRS 6243 | Assessment & Evaluation | 3 |
| NRS 6254 | Nurse Educator Practicum | 4 |

Nursing Informatics Specialization Track

| | | |
|---|---|---|
| NRS 6313 | Foundations in Nursing Informatics | 3 |
| NRS 6323 | Data Management in Healthcare | 3 |
| NRS 6333 | SDLC & Project Management | 3 |
| NRS 6343 | Evaluation Methods: Informatics | 3 |
| NRS 6354 | Nursing Informatics Practicum | 4 |

# Master of Physician Assistant Studies (117 hrs.)

The Master of Physician Assistant Studies at Trine University is a seven semester program designed to prepare students to succeed, lead, and serve the community and the physician assistant (PA) profession. The PA program will be the beginning of a lifelong journey in the pursuit of knowledge, professional development, and personal growth. The program is also committed to maintaining the highest moral and ethical standards. The PA program is a 117 credit hour 7 semester curriculum of approximately 29 months divided into didactic and experiential phases.

**Program Learning Outcomes (Competencies)**

The Trine University Master of Physician Assistant Studies Program has established academic standards and goals for student learning which provide a critical foundation for curriculum development, guideposts for classroom instruction, and a

framework for assessment (B4.03). By the end of the MPAS program, the graduating student should be able to:

**1. Knowledge Domain**

**1.1** Possess a sound knowledge of current and evolving biomedical and clinical sciences, behavioral sciences, and population health, and integrate and apply it to the medical care, health promotion, and disease prevention services offered (B1.01c, B2.11, B2.15)

**1.2** Participate in lifelong learning to continually improve clinical knowledge, clinical and technical skills, professional behaviors, and clinical reasoning and problem-solving abilities (B2.03, B2.05, B2.09, B2.18, B2.19)

**1.3** Possess sufficient knowledge of the medicolegal, regulatory, billing/coding, reimbursement, and patient safety issues inherent to medical practice (B2.14, B2.16, B2.17)

**1.4** Possess the knowledge and abilities to critically evaluate the medical literature, conduct or participate in limited research projects, and evaluate clinical environments and processes for quality, efficacy, compliance, patient safety, risk management, or other important outcomes that may impact patient care (B2.13, B2.16)

**2. Clinical Skills Domain**

**2.1** Accurately and efficiently perform medical histories and physical examinations across the lifespan that are appropriate and relevant to the clinical situation and setting (B2.07)

**2.2** Appropriately order and correctly interpret laboratory, imaging, ECG, and other diagnostic studies commonly performed in clinical settings (B2.07)

**2.3** Skillfully perform diagnostic and therapeutic procedures most commonly performed by PAs (B2.07)

**3. Clinical Reasoning and Problem-Solving Abilities Domain**

**3.1** Effectively and efficiently utilize information from the health history, physical examination, laboratory tests and other diagnostic procedures to distinguish between expected vs. abnormal findings, to formulate reasonable differential diagnoses, and to narrow the differential diagnosis list to a presumptive diagnosis in a logical, efficient, and cost-effective manner (B2.07)

**3.2** Recommend pharmacologic and non-pharmacologic therapeutic options that are most efficacious and evidence-based while also considering patient preferences and concerns, and the impacts of social, economic, and spiritual factors on health and wellness (B2.02, B2.06, B2.13)

**3.3** Provide appropriate medical care in emergent, acute, chronic, rehabilitative, palliative, and end-of-life settings (B2.08)

**3.4** Assess patient outcomes to evaluate the accuracy of diagnoses, the effectiveness of therapeutic interventions, patient compliance, and other factors that potentially impact patient care (B2.12)

**4. Technical Skills Domain**

**4.1** Effectively utilize both electronic and non-digital medical records to document findings, access clinical information, write prescriptions and orders, and make referrals (B2.02, B2.07, B2.14)

**4.2** Utilize technologies and other resources to effectively search, interpret, and appraise the medical literature for answers to clinical questions and evidence-based practices, and integrate and apply newly acquired knowledge into patient care (B2.13)

**5. Interpersonal  Communication Skills Domain**

**5.1** Document and communicate medical, legal, financial, or other relevant information to other members of the healthcare team in an accurate, logical, concise, and understandable manner (B2.04, B2.10, B2.17)

**5.2** Demonstrate appropriate and effective auditory, verbal, non-verbal, written, and electronic communication skills when dealing with patients, families, caregivers, staff, colleagues, supervising physicians, administrators, and other healthcare

professionals (B2.04, B2.10)

**5.3** Demonstrate appropriate sensitivity, empathy, compassion, and respect when dealing with diverse patient populations to promote and sustain therapeutically and ethically sound relationships (B2.06, B2.11, B2.12, B2.18)

**6. Professional Behaviors Domain**

**6.1** Abide by, and uphold, the principles espoused in the "PA Professional Oath" and the American Academy of Physician Assistant's "Guidelines to the Ethical Conduct of the Physician Assistant Profession" (B2.18)

**6.2** Demonstrate and model professional behavior, most especially in interactions with patients, families, staff, colleagues, and superiors (B2.18)

**6.3** Abide by legal and regulatory requirements pertaining to the PA profession and clinical practice settings (B2.17, B2.18)

**Accreditation**

At its **2023M** meeting, the Accreditation Review Commission on Education for the Physician Assistant, Inc. (ARC-PA) placed the **Trine University Master of Physician Assistant Studies Program** sponsored by **Trine University** on **Accreditation-Probation** status until its next review in **2025M**.

Probation accreditation is a temporary accreditation status initially of not less than two years. However, that period may be extended by the ARC-PA for up to an additional two years if the ARC-PA finds that the program is making substantial progress toward meeting all applicable standards but requires additional time to come into full compliance. Probation accreditation status is granted, at the sole discretion of the ARC-PA, when a program holding an accreditation status of Accreditation - Provisional or Accreditation - Continued does not, in the judgment of the ARC-PA, meet the *Standards* or when the capability of the program to provide an acceptable educational experience for its students is threatened.

Once placed on probation, a program that fails to comply with accreditation requirements in a timely manner, as specified by the ARC-PA, may be scheduled for a focused site visit and is subject to having its accreditation withdrawn.

Specific questions regarding the Program and its plans should be directed to the Program Director and/or the appropriate institutional official(s).

The program's accreditation history can be viewed on the ARC-PA website at https://www.arc-pa.org/accreditation-history-trine-university/.

Additional FAQs can be found on the program page.

**Didactic Phase**

The didactic phase of the PA program is comprised of four semesters and includes a total of 66 credit hours. Although primarily campus-based, students occasionally need to travel to clinical application obligations, including local inter-professional education activities.

**Experiential Phase (Clinical Year)**

The clinical phase of the PA program encompasses approximately three semesters and is organized into nine 5-week clinical rotation periods. Students will be required to return to campus approximately once every five weeks for end-of-rotation activities and will also return to campus for the last two weeks of the final semester. Not all clinicals are local or within driving distance from campus. Students are responsible for their own travel and housing expenses and should expect to travel for one to two experiences. Students are not eligible for experiential phase courses until they have successfully completed all didactic phase courses. Concurrent with the clinical experiences are the Senior Seminar and Graduate Project course series.

There are seven program-required rotation areas and opportunities for elective experiences. Required are rotations in:

- Family Medicine (5 weeks)

- Internal Medicine (5 weeks)
- Emergency Medicine (5 weeks)
- General Surgery (5 weeks)
- Women's Health (approximately 2.5 weeks)
- Pediatrics (approximately 2.5 weeks)
- Behavioral Health (approximately 2.5 weeks)

Elective rotations include (depending on preceptor availability):

- Orthopedics
- Plastic Surgery
- Hematology
- Genitourinary
- Gastroenterology
- Otorhinolaryngology
- Dermatology
- Cardiology
- Miscellaneous

**Degree Requirements**

Didactic Phase - 66 Hours

*Typical Course Sequence*

Fall 1 (16 weeks – 17 hrs.)

| | | |
|---|---|---|
| PAS 5004 | Clinical Anatomy | 4 |
| PAS 5012 | Clinical Skills I: Medical Documentation and Interviewing | 2 |
| PAS 5022 | Physician Assistant Professional Practice | 2 |
| PAS 5052 | Clinical Application and Reflection Experience I | 2 |
| PAS 5014 | Clinical Physiology | 4 |
| PAS 5213 | Diagnostic Techniques - Imaging | 3 |

Spring 1 (16 weeks – 18 hrs.)

| | | |
|---|---|---|
| PAS 5102 | Clinical Skills II: Physical Exam | 2 |
| PAS 5110 | Clinical Medicine and Therapeutics I | Other |
| PAS 5152 | Clinical Application and Reflection Experience II | 2 |
| PAS 5161 | Clinical Pharmacology I | 1 |
| PAS 5171 | Evidence Based Practice I | 1 |
| PAS 5122 | Clinical Genetics | 2 |

Summer 1 (12 weeks – 14 hrs.)

| | | |
|---|---|---|
| PAS 5212 | Clinical Skills III - Special Populations | 2 |
| PAS 5252 | Clinical Application and Reflection Experience III | 2 |
| PAS 5261 | Clinical Pharmacology II | 1 |
| PAS 5371 | Evidence Based Practice II | 1 |
| PAS 5206 | Clinical Medicine and Therapeutics II | Other |
| PAS 5112 | Diagnostic Techniques - EKG | 2 |

Fall 2 (16 weeks – 17 hrs.)

| | | |
|---|---|---|
| PAS 5310 | Clinical Medicine and Therapeutics III | Other |
| PAS 5352 | Clinical Application and Reflection Experience IV | 2 |
| PAS 5361 | Clinical Pharmacology III | 1 |
| PAS 5002 | Diagnostic Techniques - Laboratory Medicine | 2 |
| PAS 5312 | Clinical Skills IV - Procedures | 2 |

Supervised Clinical Practice Experiences (SCPE) - 51 Hours

Spring 2 (17 hrs.)

| | | |
|---|---|---|
| PAS 6015 | Clinical Practicum I | 5 |
| PAS 6025 | Clinical Practicum II | 5 |
| PAS 6035 | Clinical Practicum III | 5 |
| PAS 6141 | Senior Seminar I | 1 |
| PAS 6171 | Graduate Project I | 1 |

Summer 2 (17 hrs.)

| | | |
|---|---|---|
| PAS 6045 | Clinical Practicum IV | 5 |
| PAS 6055 | Clinical Practicum V | 5 |
| PAS 6065 | Clinical Practicum VI | 5 |
| PAS 6241 | Senior Seminar 2 | 1 |
| PAS 6271 | Graduate Project 2 | 1 |

FALL 3 (17 hrs.)

| | | |
|---|---|---|
| PAS 6075 | Clinical Practicum VII | 5 |
| PAS 6085 | Clinical Practicum VIII | 5 |
| PAS 6095 | Clinical Practicum VIIII | 5 |
| PAS 6341 | Senior Seminar 3 | 1 |
| PAS 6371 | Graduate Project 3 | 1 |

## Doctor of Physical Therapy (119 hrs.)

The Doctor of Physical Therapy Program (DPT) will provide students with the skills and expertise needed for a rewarding career as a professional physical therapist.

Students enrolled in Trine University's DPT program will be required to participate in clinical education experiences and internships in addition to the didactic coursework within the curriculum. These experiences will include part-time integrated clinical experiences (CARE) during the first five semesters and four full-time clinical internships. It is Trine University's DPT program philosophy "to bring students to the real world of physical therapy," therefore, 34 weeks of the curriculum are dedicated to full-time clinical internships. Students are required to complete clinical affiliations in a variety of settings with the intended goal to be an entry-level physical therapist at graduation.

**Mission**

The Doctor of Physical Therapy Program at Trine University, by providing high-quality, professionally focused physical

therapy education, enables its graduates and faculty to make a positive impact on the healthcare needs of their communities through service, leadership, and scholarship.

**Vision Statement**

The Doctor of Physical Therapy Program at Trine University will be recognized as a premier provider of physical therapy education, adding value to the lives of its graduates and community members.

**Goals and Outcomes**

**Goal 1:** Students will be prepared for entry-level physical therapist practice in a variety of settings, to make a positive impact on the healthcare needs of their communities through service, leadership, and scholarship**.**

**Goal 2:** Graduates of the Trine University Doctor of Physical Therapy program will be engaged in ethical, competent, and professional physical therapy practice.

**Goal 3:** Faculty of the Trine University Doctor of Physical Therapy program will advance the profession through service, leadership, or scholarship.

**Goal 4:** Faculty of the Trine University Doctor of Physical Therapy program will provide high-quality, professionally focused, physical therapy education, through the utilization of best educational practices, and the promotion of evidence-based physical therapy practice.

**Goal 5**: The Doctor of Physical Therapy program will utilize feedback from program stakeholders to establish a focus project for program improvement with a timeline.

**Goal 6:** The Doctor of Physical Therapy program will demonstrate a commitment to the physical therapy profession by facilitating collaborative activities for continuous professional growth in its communities.

**Goal 7:** The Doctor of Physical Therapy program will support core faculty clinical specialization and clinical currency in the subjects that they teach.

**Goal 8:** The Doctor of Physical Therapy program will publish a newsletter to communicate program updates and relevant physical therapy information to the community and program stakeholders.

**Accreditation**

The Doctor of Physical Therapy Program at Trine University is accredited by the Commission on Accreditation in Physical Therapy Education (CAPTE), 1111 North Fairfax Street, Alexandria, Virginia 22314; telephone: 703-706-3245; email: accreditation@apta.org; website: http://www.capteonline.org.

**Degree Requirements**

Program Requirements

| | | |
|---|---|---|
| DPT 5111 | CARE I | 1 |
| DPT 5124 | Anatomy of Movement I | 4 |
| DPT 5134 | Applied Physiology I | 4 |
| DPT 5143 | Clinical Practice I | 3 |
| DPT 5152 | Health Behavior Science | 2 |
| DPT 5162 | Professional Development I | 2 |
| DPT 5211 | CARE II | 1 |
| DPT 5224 | Anatomy of Movement II | 4 |
| DPT 5234 | Applied Physiology II | 4 |
| DPT 5241 | Cardiopulmonary PT I | 1 |
| DPT 5243 | Clinical Practice II | 3 |
| DPT 5254 | Applied Neuroscience | 4 |
| DPT 5311 | CARE III | 1 |

| | | |
|---|---|---|
| DPT 5352 | Pharmacology | 2 |
| DPT 5343 | Clinical Practice III | 3 |
| DPT 5361 | Outcome Assessment | 1 |
| DPT 5372 | Evidence Based Practice I | 2 |
| DPT 5381 | Integumentary System | 1 |
| DPT 6111 | CARE IV | 1 |
| DPT 6124 | Musculoskeletal PT I | 4 |
| DPT 6134 | Neuromuscular PT I | 4 |
| DPT 6142 | Imaging & Laboratory Testing | 2 |
| DPT 6152 | Lifespan: Pediatrics | 2 |
| DPT 6172 | Evidence Based Practice II | 2 |
| DPT 6191 | Anatomy Seminar I | 1 |
| DPT 6211 | CARE V | 1 |
| DPT 6224 | Musculoskeletal PT II | 4 |
| DPT 6233 | Neuromuscular PT II | 3 |
| DPT 6242 | Cardiopulmonary PT II | 2 |
| DPT 6252 | Lifespan: Geriatrics | 2 |
| DPT 6272 | Evidence-Based Practice III | 2 |
| DPT 6282 | Healthcare Delivery I | 2 |
| DPT 6291 | Anatomy Seminar II | 1 |
| DPT 6315 | First Full-Time Clinical Education Experience | 5 |
| DPT 6342 | Orthotics & Prosthetics | 2 |
| DPT 6352 | Primary Care Practice | 2 |
| DPT 6372 | Clinical Practice IV | 2 |
| DPT 6382 | Healthcare Delivery II | 2 |
| DPT 7118 | Terminal Full-Time Clinical Education Experience I | 8 |
| DPT 7128 | Terminal Full-Time Clinical Education Experience II | 8 |
| DPT 7162 | Professional Development II | 2 |
| DPT 7212 | Terminal Full-Time Clinical Education Experience III | Other |

## Doctorate of Occupational Therapy (103 hrs)

The Doctorate of Occupational Therapy Program at Trine University supports students in developing the skills, competencies, and knowledge base necessary to practice entry-level occupational therapy across a variety of health care settings, and in the community. Occupational therapists collaborate with clients to support their optimal engagement in occupation through outcomes focused on improvement or enhancement of the client's occupational performance; prevention of unhealthy conditions, risk factors, or diseases; improvements in the client's quality of life and well-being; and by supporting clients' access to and participation in the full range of daily life activities and roles which the client prioritizes. OTD students will be immersed in rich discussions, mentoring, and authentic hands-on classroom learning combined with experiences in both traditional healthcare settings in the community, and in emerging areas of occupational therapy. The curriculum synthesizes the humanities, occupational science, theoretical perspective, research and advocacy, and evidence-based occupational therapy practices, to prepare the OTD students for their final Level II Fieldwork experiences. Students move beyond the generalist level of occupational therapy as they complete their OTD journey by creating, implementing, managing, and presenting an in-depth Capstone Project following their mentored capstone residency experience, choosing an area of their special interest to develop additional expertise.

**Mission**

The OTD Program at Trine University will provide an innovative educational environment that develops successful occupational therapy leaders within the healthcare team and professional graduates who engage the community through evidence-based practice to optimize health and wellness.

**Vision/Philosophy Statement**

The OTD Program at Trine University will be recognized as a premier provider of occupational therapy education characterized by strategic engagement with an interdisciplinary team of healthcare students, dynamic instructional design, and occupation-based approaches that result in successful workforce-ready graduates.

**Student Learning Outcomes**

Upon successful completion of the Doctorate of Occupational Therapy program, the student will be able to:

1. Demonstrate the ability to plan, implement, and lead the occupational therapy evaluation process.

2. Utilize critical reasoning to develop innovative client-centered interventions across the lifespan to enhance meaningful engagement.

3. Perform professional roles and responsibilities that are compliant with current practice standards and align with ethical considerations and values of occupational therapy.

4. Advance the field of occupational therapy through interprofessional collaboration, advocacy, community engagement, and optimization of health and wellness.

**Accreditation**

The entry-level occupational therapy doctoral degree program has applied for accreditation by the Accreditation Council for Occupational Therapy Education (ACOTE) of the American Occupational Therapy Association (AOTA), located at 6116 Executive Boulevard, Suite 200, North Bethesda, MD 20852-4929. ACOTE's telephone number c/o AOTA is (301) 652-AOTA and its web address is www.acoteonline.org.

The program must be granted Candidacy Status, have a pre-accreditation review, complete an on-site evaluation, and be granted Accreditation Status before its graduates will be eligible to sit for the national certification examination for the occupational therapist administered by the National Board for Certification in Occupational Therapy (NBCOT). After successful completion of this exam, the individual will be an Occupational Therapist, Registered (OTR). In addition, all states require licensure in order to practice; however, state licenses are usually based on the results of the NBCOT Certification Examination. Note that a felony conviction may affect a graduate's ability to sit for the NBCOT certification examination or attain state licensure.

**Degree Requirements**

Program Requirements

| | | |
|---|---|---|
| OTD 5111 | CARE I | 1 |
| OTD 5113 | Occupational Therapy Fundamentals | 3 |
| OTD 5123 | OT Theory & Behavioral Health | 3 |
| OTD 5191 | Occupation Based Intervention 1 | 1 |
| OTD 5133 | Innovations in Practice | 3 |
| OTD 5221 | CARE II | 1 |
| OTD 5222 | Principles of Documentation | 2 |
| OTD 5232 | Professional Development | 2 |
| OTD 5243 | Scholarly Inquiry & EBP I | 3 |
| OTD 5251 | Occupation-Based Intervention 2 | 1 |
| OTD 5253 | OT Theory & Pediatrics | 3 |
| OTD 5322 | Applied Physiology I | 2 |
| OTD 5331 | CARE III | 1 |
| OTD 5332 | Practice Design and Simulation | 2 |
| OTD 5333 | Movement & Occupational Analysis | 3 |
| OTD 5343 | Scholarly Inquiry and EBP II | 3 |
| OTD 5351 | Occupation-Based Intervention 3 | 1 |

| | | |
|---|---|---|
| OTD 5353 | OT Theory & Adults | 3 |
| OTD 6423 | Neuroscience of Occupations | 3 |
| OTD 6433 | Leadership, Management, and Supervision | 3 |
| OTD 6441 | CARE IV | 1 |
| OTD 6443 | Assistive Technology in OT | 3 |
| OTD 6522 | Applied Physiology II | 2 |
| OTD 6532 | IPCP & Emerging Practice | 2 |
| OTD 6543 | Scholarly Inquiry & EBP III | 3 |
| OTD 6591 | Occupation-Based Intervention 4 | 1 |
| OTD 6551 | CARE V | 1 |
| OTD 6554 | Capstone Development | 4 |
| OTD 6553 | OT Theory & Older Adults | 3 |
| OTD 6644 | Level II Fieldwork A | 14 |
| OTD 7740 | Level II Fieldwork B | 10 |
| OTD 7841 | Doctoral Capstone Presentation | 1 |
| OTD 7844 | Doctoral Capstone Experience | 14 |

# Online Programs

**Undergraduate Degree Programs**

ASSOCIATE DEGREE PROGRAMS

- ASSOCIATE IN ACCOUNTING
- ASSOCIATE IN BUSINESS ADMINISTRATION
- ASSOCIATE IN CRIMINAL JUSTICE
- ASSOCIATE IN GENERAL STUDIES
- ASSOCIATE OF SCIENCE IN INDUSTRIAL ENGINEERING TECHNOLOGY
- ASSOCIATE OF SCIENCE IN INFORMATION SYSTEMS

BACHELOR OF ARTS WITH A MAJOR IN:

- GENERAL STUDIES

BACHELOR OF SCIENCE IN:

- CYBERSECURITY
- EXTENDED REALITY
- HEALTHCARE ADMINISTRATION
- INDUSTRIAL ENGINEERING TECHNOLOGY
- NURSING
- ORGANIZATIONAL LEADERSHIP

BACHELOR OF SCIENCE IN BUSINESS ADMINISTRATION MAJORS IN:

- ACCOUNTING
- APPLIED MANAGEMENT
- FINANCE
- HUMAN RESOURCE MANAGEMENT
- MANAGEMENT
- MARKETING

BACHELOR OF SCIENCE WITH A MAJOR IN:

- CRIMINAL JUSTICE
- INFORMATION SYSTEMS
- PSYCHOLOGY

**Certificate Programs**

- ACCOUNTING
- ADMINISTRATIVE PROFESSIONAL
- DIGITAL MARKETING
- DIVERSITY, EQUITY, INCLUSION, AND BELONGING
- HEALTHCARE ADMINISTRATION
- HEALTHCARE BILLING AND CODING CERTIFICATE
- INFORMATION SYSTEMS
- MARKETING
- ORGANIZATIONAL LEADERSHIP

**Class Scheduling**

There are three semesters per year, but the eight-week terms provide for six entry points and increased flexibility for adult students.

**Educational Delivery Systems**

Students have a choice of educational delivery systems from which to choose. Available educational delivery systems include in class, campus-based learning and computer-based distance learning. Students may choose to blend the delivery systems in a way that best meets their needs, giving them optimal flexibility as they complete their degrees.

**Activities**

CGPS students are encouraged to participate in activities at their respective education centers, but may also participate in main campus activities. Students who qualify are eligible for memberships in various scholastic honoraries, such as those in business or criminal justice. Students may use student ID cards to attend main campus events.

**Library**

All CGPS students have the opportunity to use the main campus Library and Information Services, either in person or on the Web. Multiple resources are available to all students online through the library. Students can access the Web-based catalog of the library's collection of books, media (tapes, DVDs, CDs, etc.), periodicals (journals, magazines, newspapers and other resources through magazines, newspapers), and other resources through computer labs on or off campus. Some electronic resources require a log-on for off campus use.

Students may request materials not available in the Trine University collection via the inter-library loan (ILL) service. Trine University library materials and ILL borrowed items and photocopies (periodical articles or book chapters) can be delivered to any education center. Trine University library books circulate for three-week periods and media for one-week periods. The lending library sets the loan periods for ILL borrowed items and these vary by institution. In addition, students can apply for a reciprocal borrowing card to access library collections in Indiana universities statewide. Librarians can provide research assistance and guides for using the library and its resources.

**Non-Collegiate Sponsored Instruction**

Trine University awards credit for college-level courses offered by business and professional organizations as recommended by the American Council on Education in its National Guide to Educational Credit. Credit is awarded for coursework offered by the military as recommended by the American Council on Education in its Guide to the Evaluation of Educational Experiences in the Armed Services. Credits awarded are subject to the approval of the Office of the Registrar.

**Mission**

The mission of the College of Graduate and Professional Studies/TrineOnline at Trine University is to focus on continuous improvement while providing a diverse population of learners a high-quality online education, where they will receive personalized support, preparing them to succeed in the organizations and communities they lead and serve.

# Associate Degrees

## Associate in Accounting (62 hrs.)

The associate in accounting program is designed to prepare students for immediate entry into the accounting field. It combines a concentration in accounting and computer science with business, economics and general education subjects. This program is especially appropriate for positions in businesses that require a small but knowledgeable accounting staff. As all of the credits are fully transferable to the four-year accounting major at Trine University, it serves as an excellent program for students who subsequently plan to seek a Bachelor of Science degree with an accounting major. A specified number of credit hours must be taken in each section described below. Prerequisites as shown in the Course Descriptions section of this catalog must be carefully observed. Excess credit hours in a section may not ordinarily be counted toward requirements in another section.

**Degree Requirements**

General Education Requirements - 24 hours

Communication – 6 hrs.

| | | |
|---|---|---|
| ENG 133 | Technical Communication | 3 |
| | Or | |
| ENG 143 | College Composition | 3 |
| HUM 203 | Humanities Seminar | 3 |

Humanities and Social Science – 6 hrs.

| | | |
|---|---|---|
| ECO 213 | Microeconomics | 3 |
| | Or | |
| ECO 223 | Macroeconomics | 3 |
| | Humanities Elective (3) | 3 |

Mathematics and Science – 9 hrs.

| | | |
|---|---|---|
| MA 113 | College Algebra | 3 |
| | Science Elective (3) | 3 |
| MA 253 | Statistics | 3 |

Other – 3 hrs.

| | | |
|---|---|---|
| SP 203 | Effective Speaking | 3 |

Additional Requirements - 8 hours

Required

| | | |
|---|---|---|
| BA 201 | Professional Development & Strategies | 1 |

Take one of the below:

| | | |
|---|---|---|
| BA 101 | University Experience for Ketner School of Business | 1 |
| UE 101 | University Experience | 1 |

| | | |
|---|---|---|
| UE 111 | Online Learning Orientation | 1 |

Select two of the following courses - 6 hrs.

| | | |
|---|---|---|
| BA 113 | Business Computer Applications | 3 |
| COM 213 | Business Communication | 3 |
| PSY 113 | Principles of Psychology | 3 |

Content Requirements - 30 hours

Associate Business Core - 15 hrs.

| | | |
|---|---|---|
| AC 203 | Accounting I | 3 |
| AC 213 | Accounting II | 3 |
| BA 123 | Business Concepts | 3 |
| LAW 203 | Business Law & Ethics | 3 |
| MK 203 | Marketing | 3 |

Concentration Requirements - 15 hrs.

| | | |
|---|---|---|
| AC 303 | Cost Accounting | 3 |
| AC 323 | Intermediate Accounting I | 3 |
| AC 333 | Intermediate Accounting II | 3 |
| AC 373 | Accounting Information Systems | 3 |
| AC 423 | Personal Income Tax | 3 |
| | Or | |
| AC 463 | Auditing | 3 |

## Associate in Business Administration (62 hrs.)

The associate in business administration degree program is designed to prepare a person for entry into business with a broad understanding of various business activities and their interrelationships. It combines coursework in accounting, finance, marketing, business law, and management. Courses in economics, psychology, mathematics, computer science and communication are all part of this curriculum. Both traditional and non-traditional students will find this program of interest. All credits are transferable to a Trine University four-year business administration degree for those who choose to continue their education. A specified number of credit hours must be taken in each of the following sections. Prerequisites as shown in the Course Descriptions section of this catalog must be carefully observed. Excess credit hours in a section may not ordinarily be counted toward requirements in another section.

**Degree Requirements**

General Education Requirements - 24 hours

Communication – 6 hrs.

| | | |
|---|---|---|
| ENG 133 | Technical Communication | 3 |
| | Or | |
| ENG 143 | College Composition | 3 |
| HUM 203 | Humanities Seminar | 3 |

Humanities and Social Science – 6 hrs.

| | | |
|---|---|---|
| ECO 213 | Microeconomics | 3 |
| | Or | |
| ECO 223 | Macroeconomics | 3 |
| | Humanities Elective (3) | 3 |

Mathematics and Science – 9 hrs.

| | | |
|---|---|---|
| MA 113 | College Algebra | 3 |
| | Science Elective (3) | 3 |
| MA 253 | Statistics | 3 |

Other – 3 hrs.

| | | |
|---|---|---|
| SP 203 | Effective Speaking | 3 |

Additional Requirements - 8 hours

Required

| | | |
|---|---|---|
| BA 201 | Professional Development & Strategies | 1 |

Take one of the below:

| | | |
|---|---|---|
| BA 101 | University Experience for Ketner School of Business | 1 |
| UE 101 | University Experience | 1 |
| UE 111 | Online Learning Orientation | 1 |

Select two of the following courses - 6 hrs.

| | | |
|---|---|---|
| BA 113 | Business Computer Applications | 3 |
| COM 213 | Business Communication | 3 |
| PSY 113 | Principles of Psychology | 3 |

Content Requirements - 30 hours

Associate Business Core - 15 hrs.

| | | |
|---|---|---|
| AC 203 | Accounting I | 3 |
| AC 213 | Accounting II | 3 |
| BA 123 | Business Concepts | 3 |
| LAW 203 | Business Law & Ethics | 3 |
| MK 203 | Marketing | 3 |

Concentration Requirements - 15 hrs.

| | | |
|---|---|---|
| MGT 363 | Organizational Behavior | 3 |
| | Electives (12) | 12 |

Electives: AC, BA, ECO, ENT, FIN, LAW, LDR, MGT, MK

## Associate in Criminal Justice (60 hrs.)

**Degree Requirements**

General Education Requirements - 21 hours

Communication – 6 hrs.

| | | |
|---|---|---|
| ENG 143 | College Composition | 3 |
| HUM 203 | Humanities Seminar | 3 |

Humanities and Social Science – 6 hrs.

| | | |
|---|---|---|
| SOC 103 | Principles of Sociology | 3 |
| | Humanities Elective (3) | 3 |

Mathematics and Science – 6 hrs.

| | | |
|---|---|---|
| | Mathematics Elective (3) | 3 |
| | Science Elective (3) | 3 |

Other General Education – 3 hrs.

| | | |
|---|---|---|
| POLS 113 | Introduction to Government | 3 |

Additional Requirements - 15 hours

Required

| | | |
|---|---|---|
| UE 101 | University Experience | 1 |
| | Or | |
| UE 111 | Online Learning Orientation | 1 |
| | Electives (14) | 14 |

Content Requirements - 24 hours

Required

| | | |
|---|---|---|
| CRJ 103 | Introduction to Criminal Justice | 3 |
| CRJ 133 | Criminal Justice Report Writing | 3 |
| CRJ 153 | Juvenile Justice | 3 |
| CRJ 263 | Introduction to Criminal Law & Justice | 3 |
| CRJ 273 | Criminal Procedure & Evidence | 3 |
| CRJ 343 | Criminalistics & Crime Scene Investigations | 3 |
| PSY 113 | Principles of Psychology | 3 |
| PSY 383 | Forensic Psychology | 3 |

## Associate in General Studies (60 hrs.)

**Degree Requirements**

General Education Requirements - 22 hours

Communication – 6 hrs.

| | | |
|---|---|---|
| ENG 143 | College Composition | 3 |
| HUM 203 | Humanities Seminar | 3 |

Humanities and Social Science – 6 hrs.

| | | |
|---|---|---|
| | Social Science Elective (3) | 3 |
| | Humanities Elective (3) | 3 |

Mathematics and Science – 6 hrs.

| | | |
|---|---|---|
| | Mathematics Elective (3) | 3 |
| | Science Elective (3) | 3 |

Other – 4 hrs.

| | | |
|---|---|---|
| | General Education Electives (4) | 4 |

Additional Requirements - 1 hour

Required

| | | |
|---|---|---|
| UE 101 | University Experience | 1 |
| | Or | |
| UE 111 | Online Learning Orientation | 1 |

Content Requirements - 37 hours

37 credit hours, to include at least 9 hours earned from two different academic departments

# Associate of Science in Industrial Engineering Technology (60 hrs.)

Trine University will prepare learners enrolled in the Associate of Science in Industrial Engineering Technology (ASIET) program for various hands-on roles in the manufacturing sector. ASIET graduates will “succeed, lead, and serve" their future employers through the recognition and application of manufacturing processes and problem-solving skills. Trine University ASIET graduates will contribute immediately as part of the industrial workforce with a strong manufacturing foundation, ready to uncover opportunities to increase production quality while reducing costs and lead times. The Trine University ASIET curriculum offers an introduction to industrial engineering technology and includes topics ranging from basic drafting of geometric sections to identifying health and safety risks present in manufacturing environments.

**Outcomes**
Apply technical drawing techniques to draft geometric sections.
Classify common industrial materials, their use-cases, and physical characteristics.
Apply problem solving methodologies and tools to improve manufacturing processes.
Describe manufacturing and assembly processes, equipment, and innovations in automation.
Identify environmental health and safety risks present in manufacturing environments.

**Program Requirements**

General Education Requirements (23 credits)

Written Communication (6)

| | | |
|---|---|---|
| ENG 133 | Technical Communication | 3 |
| HUM 203 | Humanities Seminar | 3 |

Social Sciences and Humanities (6)

| | | |
|---|---|---|
| ECO 203 | Survey of Economics | 3 |
| | Humanities Elective (3) | 3 |

Math and Sciences (11)

| | | |
|---|---|---|
| MA 123 | Trigonometry | 3 |
| MA 134 | Calculus I | 4 |
| PH 154 | College Physics I | 4 |

Industrial Engineering Technology Core (24 credits)

| | | |
|---|---|---|
| CSIT 163 | Using Programming to Solve Problems | 3 |
| ETD 103 | Basic Technical Drawing | 3 |
| ETD 163 | Environmental Health & Safety | 3 |
| ETD 273 | Electrical Fundamentals | 3 |
| ETD 333 | Statics & Strength of Materials | 3 |
| IET 123 | Materials & Industrial Processes | 3 |
| IET 233 | Innovations in Industrial Automation | 3 |
| IET 313 | Industrial Manufacturing & Assembly | 3 |

Additional Program Requirements (13 credits)

| | | |
|---|---|---|
| BA 201 | Professional Development & Strategies | 1 |
| UE 111 | Online Learning Orientation | 1 |
| MA 253 | Statistics | 3 |
| | Free Electives (8) | 8 |

# Associate of Science in Information Systems (60 hrs.)

Trine University will prepare students enrolled in the Associate of Science in Information Systems (ASIS) program to enter information systems occupations in supporting roles, augment skill sets in their present occupation, or move on to pursuing a bachelor’s degree in Information Systems. Throughout this program, students will be introduced to the basics of software

applications, computer networking, and database management.

**Outcomes**
Identify computing practices and emerging technologies to enhance organizational efficiency.
Utilize computer-based systems, processes, components, and programs to meet organizational needs.
Explain the impact of computing technologies on individuals, organizations, and society.
Model ethical responsibility in information systems.

**Degree Requirements**

General Education Requirements - 21 hours

Communication – 6 hrs.

| | | |
|---|---|---|
| ENG 133 | Technical Communication | 3 |
| HUM 203 | Humanities Seminar | 3 |

Humanities and Social Science – 6 hrs.

| | | |
|---|---|---|
| | Social Science Elective (3) | 3 |
| | Humanities Elective (3) | 3 |

Mathematics and Science – 6 hrs.

| | | |
|---|---|---|
| MA 113 | College Algebra | 3 |
| | Science Elective (3) | 3 |

Other – 3 hrs.

| | | |
|---|---|---|
| BA 113 | Business Computer Applications | 3 |

Additional Requirements - 15 hours

Required

| | | |
|---|---|---|
| UE 111 | Online Learning Orientation | 1 |
| | Electives (14) | 14 |

Core Requirements - 24 hours

Required

| | | |
|---|---|---|
| BA 123 | Business Concepts | 3 |
| CSIT 103 | Introduction to Information Systems | 3 |
| CSIT 123 | Computing Infrastructure Basics | 3 |
| CSIT 163 | Using Programming to Solve Problems | 3 |
| CSIT 223 | Network Management | 3 |
| INF 263 | Data Management | 3 |
| INF 393 | Data Visualization | 3 |
| INF 403 | Advanced Database Management | 3 |

# Bachelor Degrees

## Bachelor of Arts - General Studies Major (120 hrs.)

**Program Mission:**

The General Studies program prepares students for post-graduate success by allowing them to structure an individualized academic experience in close consultation with an advisor.

**Program Outcomes:**

Students will demonstrate proficiency in at least two separate academic areas.

Students will synthesize their two or three focus areas of study into a final project that demonstrates career readiness.

Students will articulate a plan for post-graduate success.

**Degree Requirements**

General Education Requirements - 33 hours

Communication – 9 hrs.

| | | |
|---|---|---|
| ENG 143 | College Composition | 3 |
| | Or | |
| ENG 133 | Technical Communication | 3 |
| HUM 203 | Humanities Seminar | 3 |
| SP 203 | Effective Speaking | 3 |

Humanities and Social Science – 9 hrs.

| | | |
|---|---|---|
| | Humanities Elective (3) | 3 |
| | Social Science Elective (3) | 3 |
| | Humanities or Social Science Elective | 3 |

Mathematics and Science – 9 hrs.

| | | |
|---|---|---|
| | Mathematics Elective (3) | 3 |
| | Science Elective (3) | 3 |
| | Math or Science Elective (3) | 3 |

Other – 6 hrs.

| | | |
|---|---|---|
| | General Education Electives (6) | 6 |

Focus Areas -- 56 hours

Students can choose two or three focus areas. A focus area consists of at least eighteen credit hours of coursework taken from a single field (i.e. courses with the same catalog prefix). Each focus area must include a minimum of six hours of coursework at the 300 level or above. Students must take a minimum of 21 credit hours at the 300 level or above.

Additional Required Coursework -- 4 hours

| | | |
|---|---|---|
| UE 101 | University Experience | 1 |
| | Or | |
| UE 111 | Online Learning Orientation | 1 |
| GS 4003 | Senior Capstone Project | 3 |

Free Electives – 27 hrs.

Electives are determined in conjunction with an advisor and based on student career objectives.

# Bachelor of Science – Criminal Justice Major (120 hrs.)

The Bachelor of Science with a major in criminal justice program is designed to prepare learners with the skills needed to be leaders in the criminal justice field. Throughout this program, learners will examine the various aspects that makeup the criminal justice system and will gain the knowledge needed to enter any criminal justice field. Learners will also develop the professional, ethical, communication, and critical thinking skills needed to be leaders within the criminal justice industry. This program also prepares learners to further their education and continue onto graduate school.

**Mission**

The mission of the Bachelor of Science with a major in criminal justice program is to prepare criminal justice professionals to enter any criminal justice field with high ethical and moral standards while exhibiting professional behavior and the knowledge needed to be leaders in their careers.

**Outcomes**

Examine components that make up the criminal justice system including law enforcement, courts, and corrections.
Assess the impact the three levels of government have on the criminal justice system.
Apply the professional and ethical conduct needed to be an effective criminal justice professional.
Develop the communication and critical thinking skills required for a criminal justice career.
Identify strengths, weaknesses, opportunities, and threats within the criminal justice system.

**Degree Requirements**

General Education Requirements - 36 hours

Communication – 9 hrs.

| | | |
|---|---|---|
| ENG 143 | College Composition | 3 |
| HUM 203 | Humanities Seminar | 3 |
| SP 203 | Effective Speaking | 3 |
| | Or | |
| COM 163 | Interpersonal Communication | 3 |

Humanities and Social Science – 9 hrs.

| | | |
|---|---|---|
| HIS 103 | American History I | 3 |
| HIS 113 | American History II | 3 |
| | Or | |
| HIS 203 | World Civilization I | 3 |
| HIS 213 | World Civilization II | 3 |
| | Humanities Elective (3) | 3 |

Mathematics and Science – 9 hrs.

| | | |
|---|---|---|
| BIO 1003 | Plants and People (no lab) | 3 |
| | Mathematics Elective (3) | 3 |
| | Math or Science Elective (3) | 3 |

Other – 9 hrs.

| | | |
|---|---|---|
| SOC 103 | Principles of Sociology | 3 |
| POLS 113 | Introduction to Government | 3 |
| PSY 113 | Principles of Psychology | 3 |

Content Requirements - 69 hours

Required

| | | |
|---|---|---|
| UE 101 | University Experience | 1 |
| | Or | |
| UE 111 | Online Learning Orientation | 1 |
| CRJ 103 | Introduction to Criminal Justice | 3 |

| | | |
|---|---|---|
| CRJ 133 | Criminal Justice Report Writing | 3 |
| CRJ 153 | Juvenile Justice | 3 |
| CRJ 243 | Introduction to Criminology | 3 |
| CRJ 263 | Introduction to Criminal Law & Justice | 3 |
| CRJ 273 | Criminal Procedure & Evidence | 3 |
| CRJ 343 | Criminalistics & Crime Scene Investigations | 3 |
| POLS 333 | State & Local Government | 3 |
| POLS 403 | American Constitutional Development | 3 |
| PSY 323 | Abnormal Psychology | 3 |

Capstone and Internship – 6 hrs.

| | | |
|---|---|---|
| CRJ 433 | Criminal Justice Capstone Demonstration | 3 |
| CRJ 473 | Criminal Justice Internship | 3 |

Free Electives – 32 hrs.

Electives are determined in conjunction with an advisor and based on student career objectives.

Concentrations - 15 hours

Select one of the following three concentrations.

Option A – Criminal Justice Professional – 15 hrs.

| | | |
|---|---|---|
| CRJ 363 | Institutional Corrections & Law | 3 |
| PSY 303 | Research Methods in Psychology | 3 |
| CRJ 423 | Criminal Justice Agency Administration | 3 |
| CRJ 453 | Topics in Criminal Justice | 3 |
| SOC 323 | The Family | 3 |

Option B – Psychology – 15 hrs.

| | | |
|---|---|---|
| PSY 223 | Life Span Developmental Psychology | 3 |
| | Or | |
| PSY 353 | Child & Adolescent Psychology | 3 |
| | | |
| PSY 303 | Research Methods in Psychology | 3 |
| PSY 333 | Psychology of Personality | 3 |
| PSY 343 | Social Psychology | 3 |
| PSY 423 | Counseling Theories & Practices | 3 |

Option C – Indiana Law Enforcement – 15 hrs.

Successful completion of Indiana Law Enforcement Academy Basic Police Training Course.

| | | |
|---|---|---|
| CRJ 4015 | Basic Police Training Course | 15 |

# Bachelor of Science – Psychology Major (120 hrs.)

**Degree Requirements**

General Education Requirements - 36 hours

Communication – 9 hrs.

| | | |
|---|---|---|
| ENG 143 | College Composition | 3 |
| HUM 203 | Humanities Seminar | 3 |

| | | |
|---|---|---|
| SP 203 | Effective Speaking | 3 |
| | Or | |
| COM 163 | Interpersonal Communication | 3 |

Humanities and Social Science – 12 hrs.

| | | |
|---|---|---|
| PSY 113 | Principles of Psychology | 3 |
| POLS 113 | Introduction to Government | 3 |
| SOC 103 | Principles of Sociology | 3 |
| | Humanities Elective (3) | 3 |

Mathematics and Science – 9 hrs.

| | | |
|---|---|---|
| | Mathematics Elective (3) | 3 |
| | Biology Elective (3) | 3 |
| | Math or Science Elective (3) | 3 |

Other – 6 hrs.

| | | |
|---|---|---|
| HIS 103 | American History I | 3 |
| | And | |
| HIS 113 | American History II | 3 |
| | Or | |
| HIS 203 | World Civilization I | 3 |
| | And | |
| HIS 213 | World Civilization II | 3 |

Content Requirements - 84 hours

Required

| | | |
|---|---|---|
| UE 101 | University Experience | 1 |
| | Or | |
| UE 111 | Online Learning Orientation | 1 |

Electives – 35 hrs.

Students wishing to pursue graduate training in psychology should also take MA 113 College Algebra and MA 253 Statistics.

| | | |
|---|---|---|
| | Electives (35) | 35 |

Required Core – 6 hrs.

| | | |
|---|---|---|
| PSY 303 | Research Methods in Psychology | 3 |
| PSY 453 | Clinical Internship I | 3 |
| | Or | |
| PSY 473 | Psychology Capstone Demonstration | 3 |

Subject Area Concentrations - 24 hrs.

Choose four of the following clinical core courses – 12 hrs.

| | | |
|---|---|---|
| PSY 323 | Abnormal Psychology | 3 |
| PSY 363/SOC 363 | Human Behavior & Counseling | 3 |
| PSY 403 | Human Sexuality | 3 |
| PSY 413 | The Psychology of Addiction | 3 |
| PSY 423 | Counseling Theories & Practices | 3 |

Choose two of the following social/cognitive core courses – 6 hrs.

| | | |
|---|---|---|
| PSY 333 | Psychology of Personality | 3 |
| PSY 343 | Social Psychology | 3 |
| PSY 373 | Political Psychology | 3 |

Choose two of the following developmental core courses – 6 hrs.

| | | |
|---|---|---|
| PSY 223 | Life Span Developmental Psychology | 3 |
| PSY 353 | Child & Adolescent Psychology | 3 |
| SOC 323 | The Family | 3 |

Additional Psychology Core Electives - 18 hrs.

Choose 18 hours from any above subject area courses not used or from the list below.

| | | |
|---|---|---|
| PSY 313 | Topics in Psychology | 3 |
| PSY 383 | Forensic Psychology | 3 |
| PSY 433 | Issues of Substance Abuse in Family Systems | 3 |
| PSY 443 | Advanced Forensic Psychology | 3 |
| PSY 483 | Counseling Issues in Substance Abuse | 3 |
| PSY 493 | Issues & Ethics in Psychology & Counseling | 3 |
| SOC 313 | Topics in Sociology | 3 |
| SM 393 | Sport Psychology | 3 |

# Bachelor of Science in Cybersecurity (120 hrs.)

In an age defined by digital transformation and rapid technological advancement, the need for cybersecurity professionals has never been more critical. As our world becomes increasingly reliant on interconnected systems, from personal devices to critical infrastructure, the safeguarding of digital assets and information is paramount. This is where our Cybersecurity Degree Program comes into play.

At Trine University, we understand the evolving landscape of cyber threats and the growing demand for experts who can protect, detect, and respond to these challenges effectively. Our Cybersecurity Degree Program is designed to equip students with the knowledge, skills, and practical experience needed to excel in this dynamic and rewarding field.

*Why Choose Our Cybersecurity Degree Program?*

Our curriculum is constantly updated to reflect the latest cybersecurity threats, technologies, and best practices. You'll learn from experienced faculty members who are actively engaged in research and industry partnerships. You'll have access to state-of-the-art labs and simulation environments, allowing you to apply your knowledge in real-world scenarios.

We also prepare you for industry certifications such as Certified Information Systems Security Professional (CISSP), Certified Ethical Hacker (CEH), and CompTIA Security+. These certifications are highly valued by employers and can boost your career prospects.

Graduates of the cybersecurity program will be qualified for jobs as a cybersecurity Analyst, Penetration Tester (Ethical Hacker), Security Consultant, Security Engineer or Architect, Security Compliance Analyst, Forensic Analyst, Chief Information Security Officer (CISO), and many others.

Through our unwavering commitment to excellence, innovation, and ethical leadership, we strive to make a lasting and positive impact on the cybersecurity landscape, securing the digital future for all.

**Mission**

At Trine University, our mission is to empower the next generation of cybersecurity professionals with the knowledge, skills, and ethical values required to protect and defend the digital world.

**Vision**

Our vision is to be recognized as a leading institution for cybersecurity education, research, and practice. We aim to produce graduates who are sought-after cybersecurity experts, capable of addressing complex challenges in the digital realm while adhering to the highest ethical standards.

**Objectives**

The following educational objectives have been developed for the Cybersecurity program at Trine University:

1. Graduates will effectively prepare and present written and verbal proposals, design reports, programs, and other technical information to a diverse audience.

2. Graduates demonstrate the importance of teamwork and leadership in executing projects, including their role within the team and their impact on the scope, budget, and schedule of the project.

3. Graduates take an active role in professional development and community outreach, including achieving industry known certifications and service to their community.

4. Graduates are trained to understand the business requirements of projects including calculating risk and generating budgets for all resources involved.

**Outcomes**

Our Cybersecurity program assures that students will be able to:

1. Assess emerging cyber threats.
2. Utilize cutting-edge technology, real-world scenarios, and hands-on labs to develop their skills in a safe and controlled environment.
3. Demonstrate a strong sense of ethics and responsibility.
4. Engage with the cybersecurity community, including industry experts, government agencies, and professional organizations.
5. Apply theoretical knowledge of cybersecurity to real-world situations.

**Degree Requirements**

General Education Requirements - 30 hours

Written Communication (6 hrs.)

| | | |
|---|---|---|
| ENG 133 | Technical Communication | 3 |
| HUM 203 | Humanities Seminar | 3 |

Oral Communication (3 hrs.)

| | | |
|---|---|---|
| SP 203 | Effective Speaking | 3 |

Social Science and Humanities (9hrs.)

| | | |
|---|---|---|
| PSY 113 | Principles of Psychology | 3 |
| PHL 313 | Ethics | 3 |
| | Humanities or Social Science Elective | 3 |

Math and Science (12 hrs.)

| | | |
|---|---|---|
| MA 113 | College Algebra | 3 |
| MA 173 | Essential Calculus | 3 |
| MA 253 | Statistics | 3 |

| | | |
|---|---|---|
| | Science Elective (3) | 3 |

Cybersecurity Core (61 hrs.)

| | | |
|---|---|---|
| CSIT 101 | Introduction to Computer Science & Information Technology | 1 |
| | Or | |
| UE 111 | Online Learning Orientation | 1 |
| CSIT 123 | Computing Infrastructure Basics | 3 |
| CSIT 153 | Introduction to Operating Systems | 3 |
| CSIT 163 | Using Programming to Solve Problems | 3 |
| CSIT 223 | Network Management | 3 |
| CSIT 253 | Artificial Intelligence & Information | 3 |
| CSIT 2023 | Linux and PowerShell | 3 |
| INF 263 | Data Management | 3 |
| INF 343 | Information Security | 3 |
| INF 403 | Advanced Database Management | 3 |
| BA 123 | Business Concepts | 3 |
| MGT 303 | Risk Management | 3 |
| MGT 383 | Principles of Project Management | 3 |
| CSIT 2033 | Programming for Cybersecurity | 3 |
| CSIT 2043 | Intro to Cloud Computing and Security | 3 |
| CSIT 2053 | Cybersecurity Law | 3 |
| CSIT 3033 | Malware Analysis and Digital Forensics | 3 |
| CSIT 3043 | Advanced Server Administration | 3 |
| CSIT 443 | Advanced Cybersecurity Concepts | 3 |
| CSIT 483 | Senior Capstone I | 3 |
| | And | |
| CSIT 493 | Senior Capstone II | 3 |
| | Or | |
| IS 483 | Information Systems Capstone Proposal | 3 |
| | And | |
| IS 493 | Information Systems Capstone Project | 3 |

Advanced Cybersecurity Concentration (Angola Campus) (15 hrs.)

| | | |
|---|---|---|
| CSIT 363 | Certified Ethical Hacking I | 3 |
| CSIT 373 | Certified Ethical Hacking II | 3 |
| CSIT 383 | Certified Ethical Hacking III | 3 |
| CSIT 393 | Certified Ethical Hacking IV | 3 |
| CSIT 403 | Applications of Cybersecurity | 3 |

Cybersecurity Professional Concentration (TrineOnline) (15 hrs.)

| | | |
|---|---|---|
| IS 3003 | Ethical Hacker | 3 |
| IS 373 | System Security | 3 |
| IS 383 | Security Analysis | 3 |
| IS 393 | Security CyberOps | 3 |
| IS 403 | Cybersecurity | 3 |

Electives (14 hrs.)

Any college-level courses, including CSIT 311X Internship Experience (1-3 hrs.)

| | | |
|---|---|---|
| | Electives (14) | 14 |

# Bachelor of Science in Extended Reality (120 hrs.)

The Bachelor of Science in Extended Reality (XR) from Trine University, prepares students for the future of technology. The curriculum is intended to prepare students for the exciting opportunity of developing XR apps and various interdisciplinary applications of XR technology. Students receive practical skills that prepare them for a successful journey of innovation in the XR field; student talents are well-rounded for the XR sector, with capabilities spanning from writing immersive tales, to developing XR apps, to applying XR technology to the industry. The curriculum emphasizes skills such as 3D modeling, quality assurance playtesting process, immersive interactive media creation, critical analysis of XR, optimized software engineering, game development using Unity, artificial intelligence, problem-solving, and how to clearly convey ideas in a collaborative environment. The program involves hands-on projects in which students design, build, and deliver XR apps fit for the fast-expanding market.

**Outcomes**

Develop immersive XR experiences using industry-standard platforms like Unity and Blender.
Develop cross-disciplinary communication skills for diverse workplaces.
Write efficient and optimized code for XR applications using professional software development cycles.
Use quality assurance testing methodology and management for market-ready applications.
Analyze the advantages of AR and VR technologies.
Apply AR and VR technologies to real-world problems.

**Degree Requirements**

General Education Requirements (30 credits)

Written Communication (6)

| | | |
|---|---|---|
| ENG 133 | Technical Communication | 3 |
| HUM 203 | Humanities Seminar | 3 |

Oral Communication (3)

| | | |
|---|---|---|
| SP 203 | Effective Speaking | 3 |

Social Sciences and Humanities (9)

| | | |
|---|---|---|
| PSY 113 | Principles of Psychology | 3 |
| | Social Sciences or Humanities elective | 3 |
| PHL 313 | Ethics | 3 |

Math and Sciences (9)

| | | |
|---|---|---|
| MA 113 | College Algebra | 3 |
| MA 253 | Statistics | 3 |
| | Science Elective (3) | 3 |

Other (3)

| | | |
|---|---|---|
| BA 113 | Business Computer Applications | 3 |

Extended Reality Core (54 credits)

| | | |
|---|---|---|
| CS 1113 | Introduction to Object-Oriented Program | 3 |
| CS 1123 | C++ & Object Oriented Design | 3 |
| CS 2103 | Algorithm Design & Analysis | 3 |
| CS 2503 | Software Engineering | 3 |
| CSIT 103 | Introduction to Information Systems | 3 |
| CSIT 163 | Using Programming to Solve Problems | 3 |
| CSIT 1023 | The History of Gaming | 3 |
| CSIT 253 | Artificial Intelligence & Information | 3 |
| CSIT 3013 | Introduction to Gameplay Creation | 3 |
| CSIT 3023 | Level, Character, and Story Building | 3 |

| | | |
|---|---|---|
| CSIT 4023 | Video Game Testing and Quality Assurance | 3 |
| XR 303 | 3D Modeling & Design for Extended Reality | 3 |
| XR 313 | Mixed Reality Development & Application | 3 |
| XR 323 | Introduction to VR Development (Unity Course) | 3 |
| XR 343 | Introduction to AR Development (Unity Course) | 3 |
| XR 413 | Interdisciplinary Applications of Extended Reality | 3 |
| IS 483 | Information Systems Capstone Proposal | 3 |
| | And | |
| IS 493 | Information Systems Capstone Project | 3 |
| | Or | |
| CSIT 493 | Senior Capstone II | 3 |
| | And | |
| CSIT 483 | Senior Capstone I | 3 |

Additional Program Requirements (36 credits)

| | | |
|---|---|---|
| BA 123 | Business Concepts | 3 |
| BA 213 | Business Spreadsheets | 3 |
| UE 111 | Online Learning Orientation | 1 |
| | Or | |
| CSIT 101 | Introduction to Computer Science & Information Technology | 1 |
| | Free Electives (29) | 29 |

# Bachelor of Science in Healthcare Administration (120 hrs.)

The Bachelor of Science in Healthcare Administration program prepares students to be effective leaders in healthcare facilities that understand issues impacting healthcare delivery. Students will develop a firm understanding of healthcare information systems, business concepts, policies, finances and leadership tools used within the healthcare industry. Students will also explore unique challenges in the healthcare industry and examine external factors impacting patient outcomes and the delivery of care.

**Degree Requirements**

General Education Requirements - 42 hours

Communication – 9 hrs.

| | | |
|---|---|---|
| ENG 133 | Technical Communication | 3 |
| | Or | |
| ENG 143 | College Composition | 3 |
| HUM 203 | Humanities Seminar | 3 |
| SP 203 | Effective Speaking | 3 |

Humanities and Social Science – 12 hrs.

| | | |
|---|---|---|
| ECO 353 | Healthcare Regulations | 3 |
| COM 233 | Intercultural Communication | 3 |
| PHL 353 | Ethical Issues in Medical Care | 3 |
| PSY 113 | Principles of Psychology | 3 |

Mathematics and Science – 9 hrs.

| | | |
|---|---|---|
| MA 113 | College Algebra | 3 |
| MA 253 | Statistics | 3 |
| BIO 163 | Medical Terminology | 3 |

Other – 12 hrs.

| | | |
|---|---|---|
| BA 213 | Business Spreadsheets | 3 |
| COM 213 | Business Communication | 3 |
| | General Education Electives (6) | 6 |

Content Requirements - 78 hours

Required

| | | |
|---|---|---|
| UE 111 | Online Learning Orientation | 1 |
| BA 201 | Professional Development & Strategies | 1 |
| CSIT 103 | Introduction to Information Systems | 3 |
| | Or | |
| | Computer Literacy | 3 |

Electives – 28 hrs.

| | | |
|---|---|---|
| | Electives (28) | 28 |

Required Core – 30 hrs.

| | | |
|---|---|---|
| CSIT 123 | Computing Infrastructure Basics | 3 |
| HC 203 | US & World Healthcare Systems | 3 |
| HC 213 | Healthcare Market Analysis | 3 |
| HC 313 | Professional Relationships | 3 |
| HC 323 | Technology and Clinical Systems | 3 |
| HC 363 | Information Systems Strategies | 3 |
| HC 433 | Applied Finance & Revenue Cycle | 3 |
| HC 463 | Effective Quality Management | 3 |
| HC 473 | Healthcare Capstone | 3 |
| HR 343 | Healthcare Human Resource Management | 3 |

Subject Area Concentrations - 15 hrs.

Option 1: Information Systems

| | | |
|---|---|---|
| CSIT 163 | Using Programming to Solve Problems | 3 |
| CSIT 223 | Network Management | 3 |
| CSIT 253 | Artificial Intelligence & Information | 3 |
| INF 263 | Data Management | 3 |
| INF 343 | Information Security | 3 |

Option 2: Organizational Leadership

| | | |
|---|---|---|
| LDR 103 | Introduction to Organization Leadership | 3 |
| LDR 203 | Leadership Strengths & Skills | 3 |
| LDR 333 | Organizational Leadership Development & Change | 3 |
| LDR 343 | Conflict Resolution | 3 |
| LDR 403 | Creativity, Innovation, and Influence | 3 |

Option 3: Healthcare Specialty

| | | |
|---|---|---|
| | Healthcare Specialty courses | 15 |

Option 4: Communication

| | | |
|---|---|---|
| COM 153 | Principles of Public Relations | 3 |
| COM 243 | Digital Media Creation | 3 |
| COM 253 | Event Planning & Promotion | 3 |
| COM 353 | Public Relations Writing & Production | 3 |
| COM 413 | Corporate & Organizational Communication | 3 |

**Outcomes**

Analyze the administration of a healthcare organization and elements that impact patient outcomes.
Examine ethical, legal, and financial factors that impact the management and distribution of healthcare services in the US.
Recognize the leadership tools and cultural competencies necessary to interact with a diverse staff and patient population.
Implement healthcare information technology to improve organizational outcomes and objectives.
Cultivate actionable insights from data to guide continuous improvement and strategic planning.
Apply analytical and measurable reasoning to address healthcare issues.

# Bachelor of Science in Industrial Engineering Technology (120 hrs.)

Trine University will prepare learners enrolled in the Bachelor of Science in Industrial Engineering Technology (BSIET) program for various leadership roles in the manufacturing sector. BSIET graduates will "succeed, lead, and serve" their future employers through the application of Lean manufacturing, process improvement methodologies, industrial data analysis, problem solving, and industrial leadership skills. Trine University BSIET graduates will emerge into the workforce as leaders with a strong manufacturing foundation ready to uncover opportunities to increase production quality while reducing costs and lead times, all while maintaining safe and regulation-compliant work environments. The Trine University BSIET curriculum offers a comprehensive review of industrial engineering technology from basic drafting of geometric sections to managing teams of professionals in an ever-changing manufacturing environment.

**Outcomes**

Apply technical drawing techniques to draft geometric sections.
Classify common and exotic industrial materials, their use-cases, and physical characteristics.
Evaluate manufacturing and assembly processes to include industrial equipment and automation.
Apply quality inspection, quality assurance, and continuous process improvement methodologies to improve manufacturing processes and operations.
Demonstrate leadership principals to lead teams of professionals, manage budgets and facilities.
Analyze supply chains.
Identify environmental health and safety risks present in manufacturing environments.
Formulate corrective action recommendations for supply chains.

**Degree Requirements**

General Education Requirements (40 credits)

Communication (6)

| | | |
|---|---|---|
| ENG 133 | Technical Communication | 3 |
| HUM 203 | Humanities Seminar | 3 |
| SP 203 | Effective Speaking | 3 |

Social Sciences and Humanities (9)

| | | |
|---|---|---|
| ECO 203 | Survey of Economics | 3 |
| PSY 113 | Principles of Psychology | 3 |
| | Humanities Elective (3) | 3 |

Math and Sciences (22)

| | | |
|---|---|---|
| CH 104 | General Chemistry I | 4 |
| MA 123 | Trigonometry | 3 |
| MA 134 | Calculus I | 4 |

| | | |
|---|---|---|
| MA 253 | Statistics | 3 |
| PH 154 | College Physics I | 4 |
| PH 164 | College Physics II | 4 |

Content Requirements - 80 credits

Management/Leadership Requirements (12 credits)

| | | |
|---|---|---|
| MGT 323 | Leadership | 3 |
| MGT 373 | Facility Management | 3 |
| MGT 383 | Principles of Project Management | 3 |
| MGT 423 | Supply Chain Management | 3 |

Industrial Engineering Technology Core (39 credits)

| | | |
|---|---|---|
| BA 433 | Business Analytics | 3 |
| CSIT 163 | Using Programming to Solve Problems | 3 |
| ETD 103 | Basic Technical Drawing | 3 |
| ETD 163 | Environmental Health & Safety | 3 |
| ETD 273 | Electrical Fundamentals | 3 |
| ETD 333 | Statics & Strength of Materials | 3 |
| IET 123 | Materials & Industrial Processes | 3 |
| IET 233 | Innovations in Industrial Automation | 3 |
| IET 253 | Quality Inspection Techniques & Tools | 3 |
| IET 313 | Industrial Manufacturing & Assembly | 3 |
| IET 403 | Quality Assurance | 3 |
| IET 413 | Senior Capstone Proposal | 3 |
| IET 423 | Senior Capstone Project | 3 |

Additional Program Requirements (29 credits)

| | | |
|---|---|---|
| BA 123 | Business Concepts | 3 |
| BA 201 | Professional Development & Strategies | 1 |
| BA 213 | Business Spreadsheets | 3 |
| UE 111 | Online Learning Orientation | 1 |
| | Free Electives (21) | 21 |

## Bachelor of Science in Information Systems Major (120 hrs.)

The Bachelor of Science in Information Systems (BSIS) prepares students for in-demand careers in fields that support complex technological environments. Students gain foundational knowledge, skills and abilities in software applications, system analysis, system design, database administration, and network management. Student will use critical thinking and applied knowledge to meet their career goals in information systems.

Information systems opportunities in the fields of technical infrastructure support, project management, cybersecurity, digital transformation, and technology leadership continue to grow at an accelerating rate. Business organizations of all types increasingly rely on technology to remain competitive and integrate all elements of the business enterprise into a responsive, proactive information system. Concentrations include: Management and Leadership, Information Systems Specialty and Cybersecurity.

**Outcomes**
Apply technology concepts to efficiently manage information technologies and processes to support business needs.
Improve strategic data and information management processes and applications.
Implement information systems concepts through a project management approach.
Assess ethical, legal, security and social responsibilities from a global perspective.

**Degree Requirements**

General Education Requirements - 30 hours

Communication – 9 hrs.

| | | |
|---|---|---|
| ENG 133 | Technical Communication | 3 |
| HUM 203 | Humanities Seminar | 3 |
| SP 203 | Effective Speaking | 3 |

Humanities and Social Science – 9 hrs.

| | | |
|---|---|---|
| PSY 113 | Principles of Psychology | 3 |
| PHL 313 | Ethics | 3 |
| | Humanities or Social Science Elective | 3 |

Mathematics and Science – 9 hrs.

| | | |
|---|---|---|
| MA 113 | College Algebra | 3 |
| MA 253 | Statistics | 3 |
| | Science Elective (3) | 3 |

Other – 3 hrs.

| | | |
|---|---|---|
| BA 113 | Business Computer Applications | 3 |

Additional Requirements - 7 hrs.

| | | |
|---|---|---|
| BA 123 | Business Concepts | 3 |
| BA 213 | Business Spreadsheets | 3 |
| UE 111 | Online Learning Orientation | 1 |

Core Requirements - 39 hours

| | | |
|---|---|---|
| COM 343 | Web Content Management | 3 |
| CSIT 103 | Introduction to Information Systems | 3 |
| CSIT 123 | Computing Infrastructure Basics | 3 |
| CSIT 153 | Introduction to Operating Systems | 3 |
| CSIT 163 | Using Programming to Solve Problems | 3 |
| CSIT 223 | Network Management | 3 |
| CSIT 273 | Enterprise Architecture | 3 |
| INF 263 | Data Management | 3 |
| INF 343 | Information Security | 3 |
| INF 393 | Data Visualization | 3 |
| INF 403 | Advanced Database Management | 3 |
| IS 483 | Information Systems Capstone Proposal | 3 |
| IS 493 | Information Systems Capstone Project | 3 |

Concentration Requirements – 15 hrs.

Option 1: Management/Leadership (15 hrs)

| | | |
|---|---|---|
| MGT 383 | Principles of Project Management | 3 |
| | MGT/LDR Elective (300/400 Level) | 3 |
| | MGT/LDR Elective (300/400 Level) | 3 |
| | MGT/LDR Elective (300/400 Level) | 3 |

| | | |
|---|---|---|
| | MGT/LDR Elective (300/400 Level) | 3 |

Option 2: Information Systems Specialty (15 hrs)

| | | |
|---|---|---|
| IS Specialty | Transfer 15 approved credits or MSIS coursework | 3 |

Option 3: Cyber Security (15 hrs)

| | | |
|---|---|---|
| IS 3003 | Ethical Hacker | 3 |
| IS 373 | System Security | 3 |
| IS 383 | Security Analysis | 3 |
| IS 393 | Security CyberOps | 3 |
| IS 403 | Cybersecurity | 3 |

Free Electives – 29 hrs.

Electives are determined in conjunction with an advisor and based on student career objectives.

# Bachelor of Science in Organizational Leadership (120 hrs.)

Trine University will prepare students enrolled in the Bachelor of Science in Organizational Leadership (BSOL) for leadership roles in corporate and non-profit sectors. Organizations in a variety of industries seek leaders who can diagnose problems, motivate and inspire employees, implement change, and create innovative solutions to problems. In keeping with the mission of Trine University to "succeed, lead and serve," BSOL students will identify and exemplify leadership theories that can be applied to today's increasingly complex organizational environments. These theories will allow students to utilize evidence-based leadership competencies including: critical thinking, interpersonal relations, decision-making and problem solving. In addition, the curriculum focuses on organizational innovation, team dynamics, organizational culture and diversity, influence and motivation, conflict resolution, and leadership communication preparing students to enter or advance in the workforce, further their education, and/or make a positive impact in their communities.

**Outcomes**

Identify critical behaviors that can positively impact the ability to lead and influence organizations' members.
Recommend strategies that will positively impact team, culture, and communication efforts within organizations.
Apply decision-making and problem-solving skills that address the importance of ethical behavior.
Describe the capabilities and personal characteristics needed from leaders to positively innovate organizations.
Apply diversity, equity, inclusion, and belonging practices to organizational leadership.

**Degree Requirements**

General Education Requirements - 33 hours

Communication – 9 hrs.

| | | |
|---|---|---|
| ENG 143 | College Composition | 3 |
| HUM 203 | Humanities Seminar | 3 |
| SP 203 | Effective Speaking | 3 |

Humanities and Social Science – 9 hrs.

| | | |
|---|---|---|
| ECO 203 | Survey of Economics | 3 |
| COM 233 | Intercultural Communication | 3 |
| PSY 113 | Principles of Psychology | 3 |

Mathematics and Science – 9 hrs.

| | | |
|---|---|---|
| MA 113 | College Algebra | 3 |
| MA 163 | Applied Math w/Business Concepts | 3 |
| | Science Elective (3) | 3 |

Other – 6 hrs.

| | | |
|---|---|---|
| BA 213 | Business Spreadsheets | 3 |
| COM 213 | Business Communication | 3 |

Business Requirements - 16 hrs.

| | | |
|---|---|---|
| BA 123 | Business Concepts | 3 |
| BA 201 | Professional Development & Strategies | 1 |
| LAW 203 | Business Law & Ethics | 3 |
| MGT 383 | Principles of Project Management | 3 |
| MK 203 | Marketing | 3 |
| MK 323 | Integrated Marketing Communication | 3 |

Content Requirements - 39 hours

| | | |
|---|---|---|
| DEI 243 | Organizational Emotional Intelligence | 3 |
| DEI 333 | Recognizing & Mitigating Unconscious Biases | 3 |
| DEI 413 | Creating a Diverse & Inclusive Organizational Culture | 3 |
| FIN 393 | Financial Leadership | 3 |
| LDR 203 | Leadership Strengths & Skills | 3 |
| LDR 313 | Topics in Organizational Leadership | 3 |
| LDR 323 | Leading Effective Teams | 3 |
| LDR 333 | Organizational Leadership Development & Change | 3 |
| LDR 343 | Conflict Resolution | 3 |
| LDR 403 | Creativity, Innovation, and Influence | 3 |
| LDR 453 | Leadership Capstone | 3 |
| MGT 313 | Human Resource Management | 3 |
| MGT 363 | Organizational Behavior | 3 |

Additional Program Requirements – 4 hrs.

| | | |
|---|---|---|
| BA 113 | Business Computer Applications | 3 |
| UE 111 | Online Learning Orientation | 1 |

Electives – 28 hrs.

| | | |
|---|---|---|
| | Electives (28) | 28 |

*Optional Industrial Leadership Specialization*
Complete the below courses (15 credits) for an Industrial Leadership Specialization.

ETD 163 Environmental Health & Safety
MGT 333 Supervision
MGT 373 Facility Management
MGT 363 Organizational Behavior
MGT 383 Principles of Project Management

## Bachelor of Science in Business Administration – Accounting Major (120 hrs.)

In the dynamic and increasingly complex business world, students need to acquire a broad education in addition to specialized skills and knowledge of the profession. Accounting education provides the technical skills necessary to function in today's business environment and provides an understanding of all aspects of business.

UNIFORM CERTIFIED PUBLIC ACCOUNTING EXAMINATION CANDIDATES

The state of Indiana and many other states require that a first-time Uniform Certified Public Accounting (CPA) Examination candidate must have at least 150 semester hours of college credit, including a baccalaureate or higher degree, with an

accounting concentration or its equivalent. An accounting major wishing to meet this requirement should plan an individualized program with his or her advisor.

**Degree Requirements**

General Education Requirements - 39 hours

Communication – 12 hrs.

| | | |
|---|---|---|
| ENG 133 | Technical Communication | 3 |
| | Or | |
| ENG 143 | College Composition | 3 |
| HUM 203 | Humanities Seminar | 3 |
| SP 203 | Effective Speaking | 3 |
| COM 213 | Business Communication | 3 |

Humanities and Social Science – 9 hrs.

| | | |
|---|---|---|
| ECO 213 | Microeconomics | 3 |
| ECO 223 | Macroeconomics | 3 |
| | Or | |
| ECO 203 | Survey of Economics | 3 |
| | Social Science Elective (3) | 3 |
| | Humanities Elective (3) | 3 |

Mathematics and Science – 12 hrs.

| | | |
|---|---|---|
| MA 113 | College Algebra | 3 |
| MA 173 | Essential Calculus | 3 |
| | Or | |
| MA 163 | Applied Math w/Business Concepts | 3 |
| MA 253 | Statistics | 3 |
| | Science Elective (3) | 3 |

Other – 6 hrs.

| | | |
|---|---|---|
| BA 213 | Business Spreadsheets | 3 |
| PSY 113 | Principles of Psychology | 3 |

Additional Requirements - 81 hours

Take one of the below:

| | | |
|---|---|---|
| BA 101 | University Experience for Ketner School of Business | 1 |
| BA 102 | University Experience-Business Students | 2 |
| UE 101 | University Experience | 1 |

*UE 111 Online Learning Orientation for students in the online program

Business Core – 37-39hrs.

| | | |
|---|---|---|
| AC 203 | Accounting I | 3 |
| AC 213 | Accounting II | 3 |
| BA 123 | Business Concepts | 3 |

| | | |
|---|---|---|
| BA 201 | Professional Development & Strategies | 1 |
| BA 3113 | Business Internship | 3 |
| BA 453 | Global Strategic Management | 3 |
| FIN 303 | Managerial Finance | 3 |
| FIN 353 | Personal Finance | 3 |
| LAW 203 | Business Law & Ethics | 3 |
| MGT 353 | Designing Operations | 3 |
| MGT 363 | Organizational Behavior | 3 |
| MGT 483 | Capstone | 3 |
| MK 203 | Marketing | 3 |

BA 3113: Advisor will determine the appropriate class anywhere between BA 3111 and BA 3113 (1 - 3 credits worth of internship work)

Concentration Requirements - 30 hrs.

| | | |
|---|---|---|
| AC 303 | Cost Accounting | 3 |
| AC 323 | Intermediate Accounting I | 3 |
| AC 333 | Intermediate Accounting II | 3 |
| AC 373 | Accounting Information Systems | 3 |
| AC 403 | Advanced Accounting | 3 |
| AC 423 | Personal Income Tax | 3 |
| AC 463 | Auditing | 3 |
| FIN 413 | Advanced Managerial Finance | 3 |
| | Business Electives (6) | 6 |

Business Electives: 300-400 level from AC or FIN

Electives – 12-14 hrs.

| | | |
|---|---|---|
| | Free Electives (12-14) | 12-14 |

## Bachelor of Science in Business Administration - Applied Management (120 hrs.)

The BSBA with a major in Applied Management degree is designed to prepare an individual with an interest in management in a field where technical competence, has at a minimum, been partially acquired. This program is available to individuals who have already completed some equivalent training in a business, health, technical field, or other specialty area not offered at Trine University. The degree is designed specifically for individuals who acquired training at community colleges, technical institutes, military service schools, industry related schools, etc., and who want to continue their education in the area of management. The program's goal is to equip students with the quality educational tools needed for a career in management.

TECHNICAL SPECIALTY

Students completing the Bachelor of Applied Management degree program must complete a minimum of 27 semester hours in a business or technical field acquired through occupational, technical training or classroom instruction. As many as 3 additional semester hours in a technical specialty may count as electives.

**Degree Requirements**

General Education Requirements - 39 hours

Communication – 12 hrs.

| | | |
|---|---|---|
| ENG 133 | Technical Communication | 3 |
| | Or | |
| ENG 143 | College Composition | 3 |
| HUM 203 | Humanities Seminar | 3 |

| | | |
|---|---|---|
| SP 203 | Effective Speaking | 3 |
| COM 213 | Business Communication | 3 |

Humanities and Social Science – 9 hrs.

| | | |
|---|---|---|
| ECO 213 | Microeconomics | 3 |
| ECO 223 | Macroeconomics | 3 |
| | Or | |
| ECO 203 | Survey of Economics | 3 |
| | Social Science Elective (3) | 3 |
| | Humanities Elective (3) | 3 |

Mathematics and Science – 12 hrs.

| | | |
|---|---|---|
| MA 113 | College Algebra | 3 |
| MA 173 | Essential Calculus | 3 |
| | Or | |
| MA 163 | Applied Math w/Business Concepts | 3 |
| MA 253 | Statistics | 3 |
| | Science Elective (3) | 3 |

Other – 6 hrs.

| | | |
|---|---|---|
| BA 213 | Business Spreadsheets | 3 |
| PSY 113 | Principles of Psychology | 3 |

Additional Requirements - 81 hours

Take one of the below:

| | | |
|---|---|---|
| BA 101 | University Experience for Ketner School of Business | 1 |
| BA 102 | University Experience-Business Students | 2 |
| UE 101 | University Experience | 1 |

*UE 111 Online Learning Orientation for students in the online program

Business Core – 37 - 39 hrs.

| | | |
|---|---|---|
| AC 203 | Accounting I | 3 |
| AC 213 | Accounting II | 3 |
| BA 123 | Business Concepts | 3 |
| BA 201 | Professional Development & Strategies | 1 |
| BA 3113 | Business Internship | 3 |
| BA 453 | Global Strategic Management | 3 |
| FIN 303 | Managerial Finance | 3 |
| FIN 353 | Personal Finance | 3 |
| LAW 203 | Business Law & Ethics | 3 |
| MGT 353 | Designing Operations | 3 |
| MGT 363 | Organizational Behavior | 3 |
| MGT 483 | Capstone | 3 |
| MK 203 | Marketing | 3 |

BA 3111 - BA 3113: Advisor will determine the appropriate class anywhere between BA 3111 and BA 3113 (1 -3 credits worth of internship work)

Concentration Requirements - 30 hrs.

Business courses with approval of Advisor or Chair – Student must be transferring in all 27 hours of a technical field/concentration. If a student can't transfer in all 27 hours, it must be a field that can be completed at Trine such as Criminal Justice. If the student does not have 27 hours and it can't be completed at Trine, the transfer credits can't be accepted as an applied management concentration. They should be considered as a normal transfer evaluation.

| | | |
|---|---|---|
| | Technical Field/Concentration Courses | 27 |
| | Business Elective/Technical Specialty (3) | 3 |

Business Elective/Technical Specialty: AC, ENT, FIN, HR, LAW, LDR, MGT, MK

Electives – 12-14 hrs.

| | | |
|---|---|---|
| | Free Electives (12-14) | 12-14 |

# Bachelor of Science in Business Administration - Finance Major (120 hrs.)

**Degree Requirements**

General Education Requirements - 39 hours

Communication – 12 hrs.

| | | |
|---|---|---|
| ENG 133 | Technical Communication | 3 |
| | Or | |
| ENG 143 | College Composition | 3 |
| HUM 203 | Humanities Seminar | 3 |
| SP 203 | Effective Speaking | 3 |
| COM 213 | Business Communication | 3 |

Humanities and Social Science – 9 hrs.

| | | |
|---|---|---|
| ECO 213 | Microeconomics | 3 |
| ECO 223 | Macroeconomics | 3 |
| | Or | |
| ECO 203 | Survey of Economics | 3 |
| | Social Science Elective (3) | 3 |
| | Humanities | 3 |

Mathematics and Science – 12 hrs.

| | | |
|---|---|---|
| MA 113 | College Algebra | 3 |
| MA 173 | Essential Calculus | 3 |
| | Or | |
| MA 163 | Applied Math w/Business Concepts | 3 |
| MA 253 | Statistics | 3 |
| | Science Elective (3) | 3 |

Other – 6 hrs.

| | | |
|---|---|---|
| BA 213 | Business Spreadsheets | 3 |
| PSY 113 | Principles of Psychology | 3 |

Additional Requirements - 81 hours

Take one of the below:

| | | |
|---|---|---|
| BA 101 | University Experience for Ketner School of Business | 1 |
| BA 102 | University Experience-Business Students | 2 |
| UE 101 | University Experience | 1 |
| UE 111 | Online Learning Orientation | 1 |

*UE 111 Online Learning Orientation for students in the online program

Business Core – 37-39 hrs.

| | | |
|---|---|---|
| AC 203 | Accounting I | 3 |
| AC 213 | Accounting II | 3 |
| BA 123 | Business Concepts | 3 |
| BA 201 | Professional Development & Strategies | 1 |
| BA 3113 | Business Internship | 3 |
| BA 453 | Global Strategic Management | 3 |
| FIN 303 | Managerial Finance | 3 |
| FIN 353 | Personal Finance | 3 |
| LAW 203 | Business Law & Ethics | 3 |
| MGT 353 | Designing Operations | 3 |
| MGT 363 | Organizational Behavior | 3 |
| MGT 483 | Capstone | 3 |
| MK 203 | Marketing | 3 |

BA 3113: Advisor will determine the appropriate class anywhere between BA 3111 and BA 3113 (1 - 3 credits worth of internship work)

Concentration Requirements - 30 hrs.

| | | |
|---|---|---|
| AC 423 | Personal Income Tax | 3 |
| FIN 323 | Money & Banking | 3 |
| FIN 403 | Investments | 3 |
| FIN 413 | Advanced Managerial Finance | 3 |
| FIN 473 | Finance Modeling | 3 |

Corporate Track:

| | | |
|---|---|---|
| AC 303 | Cost Accounting | 3 |
| FIN 343 | International Finance | 3 |
| | Accounting or Finance Electives (9) | 9 |

AC, BUS, MGT, MK, or FIN Electives: 300 level or above, including Graduate courses

Wealth Management Track:

| | | |
|---|---|---|
| FIN 383 | Risk & Insurance | 3 |
| FIN 423 | Portfolio & Wealth Planning | 3 |
| MK 423 | Professional Selling | 3 |
| | Accounting or Finance Elective (6) | 6 |

AC, BUS, MGT, MK, or FIN Electives: 300 level or above, including Graduate courses

Electives – 12-14 hrs.

| | | |
|---|---|---|
| | Free Electives (12-14) | 12-14 |

# Bachelor of Science in Business Administration - Human Resource Management (120 hrs.)

**Degree Requirements**

General Education Requirements - 39 hours

Communication – 12 hrs.

| | | |
|---|---|---|
| ENG 133 | Technical Communication | 3 |
| | Or | |
| ENG 143 | College Composition | 3 |
| HUM 203 | Humanities Seminar | 3 |
| SP 203 | Effective Speaking | 3 |
| COM 213 | Business Communication | 3 |

Humanities and Social Science – 9 hrs.

| | | |
|---|---|---|
| ECO 213 | Microeconomics | 3 |
| ECO 223 | Macroeconomics | 3 |
| | Or | |
| ECO 203 | Survey of Economics | 3 |
| | Social Science Elective (3) | 3 |
| | Humanities Elective (3) | 3 |

Mathematics and Science – 12 hrs.

| | | |
|---|---|---|
| MA 113 | College Algebra | 3 |
| MA 173 | Essential Calculus | 3 |
| | Or | |
| MA 163 | Applied Math w/Business Concepts | 3 |
| MA 253 | Statistics | 3 |
| | Science Elective (3) | 3 |

Other – 6 hrs.

| | | |
|---|---|---|
| BA 213 | Business Spreadsheets | 3 |
| PSY 113 | Principles of Psychology | 3 |

Additional Requirements - 81 hours

Business Core – 38 hrs.

| | | |
|---|---|---|
| UE 111 | Online Learning Orientation | 1 |
| AC 203 | Accounting I | 3 |
| AC 213 | Accounting II | 3 |
| BA 123 | Business Concepts | 3 |
| BA 201 | Professional Development & Strategies | 1 |
| FIN 303 | Managerial Finance | 3 |
| LAW 203 | Business Law & Ethics | 3 |
| MGT 353 | Designing Operations | 3 |
| MGT 363 | Organizational Behavior | 3 |
| MK 203 | Marketing | 3 |
| MGT 483 | Capstone | 3 |
| BA 453 | Global Strategic Management | 3 |

| | | |
|---|---|---|
| FIN 353 | Personal Finance | 3 |
| BA 3113 | Business Internship | 3 |
| | Or | |
| MGT 473 | Capsim Business Simulation | 3 |

Concentration Requirements - 30 hrs.

| | | |
|---|---|---|
| HR 303 | Compensation & Benefits | 3 |
| HR 323 | Safety & Health Management | 3 |
| LAW 403 | Employment Law | 3 |
| MGT 303 | Risk Management | 3 |
| MGT 313 | Human Resource Management | 3 |
| MGT 323 | Leadership | 3 |
| MGT 343 | Human Resource Development | 3 |
| MGT 383 | Principles of Project Management | 3 |
| PSY 363/SOC 363 | Human Behavior & Counseling | 3 |
| | Business Elective (3) | 3 |

Business Electives: 300-400 level from AC, BA, ENT, FIN, HR, LAW, LDR, MGT, MK

Additional Requirements – 3

| | | |
|---|---|---|
| BA 113 | Business Computer Applications | 3 |

Electives – 10 hrs.

| | | |
|---|---|---|
| | Electives (10) | 10 |

## Bachelor of Science in Business Administration - Management Major (120 hrs.)

Management pervades all facets of a business organization. Operations management studies the manufacturing and service processes where many new quantitative techniques are applied. Human resources involves the study of the human factor in business organizations. Students who select this major are preparing themselves for positions in firms regardless of size or organizational structure.

**Degree Requirements**

General Education Requirements - 39 hours

Communication – 12 hrs.

| | | |
|---|---|---|
| ENG 133 | Technical Communication | 3 |
| | Or | |
| ENG 143 | College Composition | 3 |
| HUM 203 | Humanities Seminar | 3 |
| SP 203 | Effective Speaking | 3 |
| COM 213 | Business Communication | 3 |

Humanities and Social Science – 9 hrs.

| | | |
|---|---|---|
| ECO 213 | Microeconomics | 3 |
| ECO 223 | Macroeconomics | 3 |
| | Or | |
| ECO 203 | Survey of Economics | 3 |
| | Social Science Elective (3) | 3 |

| | | |
|---|---|---|
| | Humanities Elective (3) | 3 |

Mathematics and Science – 12 hrs.

| | | |
|---|---|---|
| MA 113 | College Algebra | 3 |
| MA 173 | Essential Calculus | 3 |
| | Or | |
| MA 163 | Applied Math w/Business Concepts | 3 |
| MA 253 | Statistics | 3 |
| | Science Elective (3) | 3 |

Other – 6 hrs.

| | | |
|---|---|---|
| BA 213 | Business Spreadsheets | 3 |
| PSY 113 | Principles of Psychology | 3 |

Additional Requirements - 81 hours

Take one of the below:

| | | |
|---|---|---|
| BA 101 | University Experience for Ketner School of Business | 1 |
| BA 102 | University Experience-Business Students | 2 |
| UE 101 | University Experience | 1 |

*UE 111 Online Learning Orientation for students in the online program

Business Core – 35-37 hrs.

| | | |
|---|---|---|
| AC 203 | Accounting I | 3 |
| AC 213 | Accounting II | 3 |
| BA 123 | Business Concepts | 3 |
| BA 201 | Professional Development & Strategies | 1 |
| BA 3113 | Business Internship | 3 |
| BA 453 | Global Strategic Management | 3 |
| FIN 303 | Managerial Finance | 3 |
| FIN 353 | Personal Finance | 3 |
| LAW 203 | Business Law & Ethics | 3 |
| MGT 353 | Designing Operations | 3 |
| MGT 363 | Organizational Behavior | 3 |
| MGT 483 | Capstone | 3 |
| MK 203 | Marketing | 3 |

BA 3111 - 3113: Advisor will determine the appropriate class anywhere between BA 3111 and BA 3113 (1 - 3 credits worth of internship work).

Concentration Requirements - 30 hrs.

| | | |
|---|---|---|
| BA 433 | Business Analytics | 3 |
| MGT 303 | Risk Management | 3 |
| MGT 313 | Human Resource Management | 3 |
| MGT 323 | Leadership | 3 |
| MGT 383 | Principles of Project Management | 3 |
| | Management Elective (6) | 6 |
| | Business Electives (9) | 9 |

Management Electives - Choose any MGT 300/400 Level (6 hrs.)

Business Electives - 9 hours

Applicable courses with following prefixes that align with student career goals and based upon advisor recommendation and approval (AC, BA, COM, ECO, ENT, FIN, GM, HC, HR, INF, LAW, LDR, MGT, MK, SM)

Electives – 12-14 hrs.

| | | |
|---|---|---|
| | Free Electives (12-14) | 12-14 |

# Bachelor of Science in Business Administration - Marketing Major (120 hrs.)

Marketing involves creating and satisfying the demands of consumers. It is the study of the organizations and systems involved in the rendering of personal services to the consumer and the physical distribution of goods from the producer to the consumer. The marketing major will discover career opportunities in the fields of sales management, advertising, market research, retailing, brand/product management, merchandising, and marketing management.

**Degree Requirements**

General Education Requirements - 39 hours

Communication – 12 hrs.

| | | |
|---|---|---|
| ENG 133 | Technical Communication | 3 |
| | Or | |
| ENG 143 | College Composition | 3 |
| HUM 203 | Humanities Seminar | 3 |
| SP 203 | Effective Speaking | 3 |
| COM 213 | Business Communication | 3 |

Humanities and Social Science – 9 hrs.

| | | |
|---|---|---|
| ECO 213 | Microeconomics | 3 |
| ECO 223 | Macroeconomics | 3 |
| | Or | |
| ECO 203 | Survey of Economics | 3 |
| | Social Science Elective (3) | 3 |
| | Humanities | 3 |

Mathematics and Science – 12 hrs.

| | | |
|---|---|---|
| MA 113 | College Algebra | 3 |
| MA 173 | Essential Calculus | 3 |
| | Or | |
| MA 163 | Applied Math w/Business Concepts | 3 |
| MA 253 | Statistics | 3 |
| | Science Elective (3) | 3 |

Other – 6 hrs.

| | | |
|---|---|---|
| BA 213 | Business Spreadsheets | 3 |
| PSY 113 | Principles of Psychology | 3 |

Additional Requirements - 81 hours

Take one of the below:

| | | |
|---|---|---|
| BA 101 | University Experience for Ketner School of Business | 1 |
| BA 102 | University Experience-Business Students | 2 |
| UE 101 | University Experience | 1 |

*UE 111 Online Learning Orientation for students in the online program

Business Core – 38 hrs.

| | | |
|---|---|---|
| AC 203 | Accounting I | 3 |
| AC 213 | Accounting II | 3 |
| BA 123 | Business Concepts | 3 |
| BA 201 | Professional Development & Strategies | 1 |
| BA 453 | Global Strategic Management | 3 |
| FIN 303 | Managerial Finance | 3 |
| FIN 353 | Personal Finance | 3 |
| LAW 203 | Business Law & Ethics | 3 |
| MGT 353 | Designing Operations | 3 |
| MGT 363 | Organizational Behavior | 3 |
| MGT 483 | Capstone | 3 |
| MK 203 | Marketing | 3 |
| MGT 473 | Capsim Business Simulation | 3 |
| | Or | |
| BA 3113 | Business Internship | 3 |

Concentration Requirements - 30 hrs.

| | | |
|---|---|---|
| MK 323 | Integrated Marketing Communication | 3 |
| MK 363/PSY 3063 | Commerce and Consumer Behavior | 3 |
| MK 423 | Professional Selling | 3 |
| MK 433 | Marketing Strategy | 3 |
| MK 463 | Marketing Research | 3 |
| | Business Electives (15) | 15 |

Business Elective (300/400 Level) - 15 hours

Applicable courses with following prefixes that align with student career goals and based upon advisor recommendation and approval (AC, BA, COM, ECO, ENT, FIN, GM, HC, HR, INF, LAW, LDR, MGT, MK, SM)

Electives – 13 hrs.

| | | |
|---|---|---|
| BA 113 | Business Computer Applications | 3 |
| | Free Electives (10) | 10 |

# Certificates

ACCOUNTING CERTIFICATE

ADMINISTRATIVE PROFESSIONAL CERTIFICATE

DIGITAL MARKETING CERTIFICATE

DIVERSITY EQUITY INCLUSION AND BELONGING CERTIFICATE

HEALTHCARE ADMINISTRATION CERTIFICATE

HEALTHCARE BILLING AND CODING CERTIFICATE

INFORMATION SYSTEMS CERTIFICATE

MARKETING CERTIFICATE

ORGANIZATIONAL LEADERSHIP CERTIFICATE

# Accounting Certificate

With Trine University's online certificate in Accounting, students will be prepared for a variety of jobs in public accounting, private industry, government, and non-profit organizations. Students will explore various topics in accounting, including: the processing of accounting information, accrual accounting, budgeting, comprehensive accounting theory and practice, basic concepts of tax law, and income tax preparation and research. Additionally, students will develop their accounting skills by using tools to complete the accounting cycle, including software applications. This certificate program will prepare students to advance in the workforce or to pursue a degree. Required coursework for the Accounting certificate may be applied towards the Bachelor of Science in Business Administration – Accounting Major program.

The certificate in Accounting will accept transfer credit for MA 113 College Algebra, or higher equivalent, as applicable.

**Outcomes**
Prepare journal entries, adjusting entries, and closing entries.
Explain the steps of an accounting cycle in various businesses.
Prepare financial statements.
Prepare an income statement budget with objectives and impact.
Analyze accounting transactions that apply to income tax.
Evaluate how tax decisions affect business transactions and decisions.

**Accounting Certificate**

| Accounting Certificate | | |
|---|---|---|
| MA 113 | College Algebra | 3 |
| AC 203 | Accounting I | 3 |
| AC 213 | Accounting II | 3 |
| AC 323 | Intermediate Accounting I | 3 |
| AC 333 | Intermediate Accounting II | 3 |
| AC 423 | Personal Income Tax | 3 |
| UE 111 | Online Learning Orientation | 1 |

# Administrative Professional Certificate

Trine University's online Administrative Professional Certificate will prepare students for organizational and managerial positions in government, law, banking, health care, education, manufacturing, franchising, and any number of career opportunities where office management and related expertise are essential. Throughout this program, students will explore the skills that both small and large employers find necessary for success. This certificate program will prepare students to advance in the workforce or to pursue a degree. Required coursework for the Administrative Professional Certification can be applied towards any of the Bachelor of Science in Business Administration programs (accounting, marketing, management, applied management, and human resource management.

The Administrative Professional Certificate will accept transfer credit for ENG 143 College Composition or ENG 133 Technical Communication as applicable.

**Outcomes**
Apply Microsoft Office word processing, presentation and spreadsheet skills to business office settings including project management, budgeting, professional communications and data analysis.
Develop charts and graphs to communicate business information.
Apply ethical reasoning to a variety of business situations.
Identify solutions to business problems.
Apply leadership and management skills to a wide variety of business settings.
Explain how changing public policy and globalization impacts business decision making and corporate social responsibility.

**Business Administration Certificate**

| Business Administration Certificate | | |
|---|---|---|
| BA 113 | Business Computer Applications | 3 |
| BA 123 | Business Concepts | 3 |
| BA 213 | Business Spreadsheets | 3 |
| COM 213 | Business Communication | 3 |
| LAW 203 | Business Law & Ethics | 3 |
| UE 111 | Online Learning Orientation | 1 |

## Digital Marketing Certificate

With Trine University's online certificate in Digital Marketing, students will explore consumer behavior, major business functions, integration of digital media, variables of product, promotion, placement, and price, e-marketing, blogging, social media, and content management software. This certificate program will prepare students to advance in the workforce or to pursue a degree. Required coursework for the Marketing certificate may be applied towards the online Bachelor of Science in Business Administration – Marketing Major program.

**Outcomes**
Describe specific issues facing the businessperson in ethics, globalization, and motivation.
Analyze various new digital media technologies and techniques.
Assess the role digital marketing plays in the social and economic systems.
Investigate the importance of digital ethics, privacy issues with social media, and codes of conduct within digital marketing.
Identify core business principles in the primary areas of digital marketing and new media management.

**Digital Marketing Certificate**

| Digital Marketing Certificate | | |
|---|---|---|
| BA 123 | Business Concepts | 3 |
| MK 203 | Marketing | 3 |
| COM 243 | Digital Media Creation | 3 |
| MK 473 | Digital Advertising | 3 |
| MK 453 | Strategic Digital Marketing Certification | 3 |
| | Or | |
| COM 343 | Web Content Management | 3 |
| UE 111 | Online Learning Orientation | 1 |

## Diversity, Equity, Inclusion, and Belonging Certificate

With Trine University's online certificate in Diversity, Equity, Inclusion, and Belonging students will explore the skills needed to make culturally competent decisions within an organization. This certificate focuses on intercultural communication, bias, emotional intelligence, and diversity acceptance in the workplace providing learners with the skills needed to lead an organization that fosters equality and success. Societal factors that relate to unconscious bias will be examined as well as the

impact of biases on workplace relationships. The development of emotional intelligence will provide learners with the skills needed to make objective decisions, not based on preconceived opinions and cultural judgments. Students will model efficient communication skills to successfully achieve goals within a group of diverse individuals. This certificate program will prepare students to advance in the workforce or to pursue a degree. Required coursework for the Diversity, Equity, Inclusion, and Belonging certificate may be applied towards the Bachelor of Science in Organizational Leadership program.

**Outcomes**
Analyze topics of intercultural communication such as perception, social identity, and cultural competency.
Describe emotional intelligence as it relates to the presence of trust and awareness within an organization.
Identify key concepts of diverse organizational culture with emphasis on acceptance, inclusion, and belonging.
Examine unconscious bias and the impact it has on individual beliefs and decision-making processes.

**Diversity, Equity, Inclusion, and Belonging Certificate**

| Diversity, Equity, Inclusion, and Belonging Certificate | | |
|---|---|---|
| COM 233 | Intercultural Communication | 3 |
| DEI 243 | Organizational Emotional Intelligence | 3 |
| DEI 333 | Recognizing & Mitigating Unconscious Biases | 3 |
| DEI 413 | Creating a Diverse & Inclusive Organizational Culture | 3 |
| LDR 323 | Leading Effective Teams | 3 |
| UE 111 | Online Learning Orientation | 1 |

## Healthcare Administration Certificate

With Trine University's online certificate in Healthcare Administration, students will examine foundational healthcare administration skills including business, finance, market analysis, and quality management. This certificate provides students with diverse offerings in healthcare administration and management, providing graduates with the skills needed to lead successfully in a healthcare setting. This certificate program will prepare students to advance in the workforce or to pursue a degree. Required coursework for the Healthcare Administration certificate may be applied towards the Bachelor of Science in Healthcare Administration program.

**Outcomes**
Develop organizational processes and procedures using leadership and management theories.
Apply financial management models to healthcare institutions and revenue cycles.
Apply market research and analysis to the healthcare setting.
Assess the roles of management and administration in the healthcare industry.

**Healthcare Administration Certificate**

| Healthcare Administration Certificate | | |
|---|---|---|
| BIO 163 | Medical Terminology | 3 |
| HC 213 | Healthcare Market Analysis | 3 |
| HC 363 | Information Systems Strategies | 3 |
| HC 433 | Applied Finance & Revenue Cycle | 3 |
| HC 463 | Effective Quality Management | 3 |
| HR 343 | Healthcare Human Resource Management | 3 |
| UE 111 | Online Learning Orientation | 1 |

## Healthcare Billing and Coding Certificate

This program introduces the fundamentals of medical billing and coding. Students will recognize the association between the delivery of healthcare services and the need to appropriately secure reimbursement. The program will prepare students to function in medical billing/coding departments, as well as billing/coding facilities. Required coursework for the Healthcare Billing and Coding certificate may be applied towards the Bachelor of Science in Healthcare Administration.

**Healthcare Billing and Coding Certificate**

| Healthcare Billing and Coding Certificate | | |
|---|---|---|
| BIO 163 | Medical Terminology | 3 |
| CSIT 123 | Computing Infrastructure Basics | 3 |
| HC 203 | US & World Healthcare Systems | 3 |
| HC 363 | Information Systems Strategies | 3 |
| HC 273 | Healthcare Billing and Coding | 3 |
| UE 111 | Online Learning Orientation | 1 |

**Outcomes**
Explain the fundamentals of medical coding, billing, and reimbursement methods.
Recognize the framework, connections, and data flow between HIT software and hardware.
Identify basic medical terminology through the study of root words, prefixes, and suffixes.
Analyze the impact of historical data on the present and future of the U.S. healthcare system.
Identify the benefits and challenges of implementing healthcare information systems.

## Information Systems Certificate

With Trine University's online certificate in Information Systems, students will prepare for a variety of positions in the information technology (IT) industry by exploring various topics, including computer processing, operating systems, using programming to solve complex business problems, networking management, and data management and visualization. This certificate program will prepare students to advance in the workforce or to pursue a degree. Required coursework for the Information Systems certificate may be applied towards the Bachelor of Science in Information Systems program.

**Outcomes**
Identify computing practices in industry and emerging technologies, emphasizing a working knowledge of current software design and development techniques.
Build a computer-based system, process, component, or program to meet desired needs.
Explain the impact of computing technologies on individuals, organizations, and society.

**Information Systems Certificate**

| Information Systems Certificate | | |
|---|---|---|
| CSIT 103 | Introduction to Information Systems | 3 |
| CSIT 123 | Computing Infrastructure Basics | 3 |
| CSIT 223 | Network Management | 3 |
| INF 263 | Data Management | 3 |
| INF 343 | Information Security | 3 |
| INF 403 | Advanced Database Management | 3 |
| UE 111 | Online Learning Orientation | 1 |

## Marketing Certificate

With Trine University's online certificate in Marketing, students will explore the advanced marketing knowledge, techniques and concepts needed to guide new product development, expand into new markets, and encourage customer loyalty. Emphasis is placed on consumer and organizational buying behavior, methods for identifying and selecting marketing strategies that build brand equity, and business concepts (ethics, globalization, motivation, finance, economics, etc.). This certificate program will prepare students to advance in the workforce or to pursue a degree. Required coursework for the Marketing certificate may be applied toward the online Bachelor of Science in Business Administration – Marketing Major program.

**Outcomes**
Apply national and international consumer behavior concepts to consumer trends.
Evaluate business issues and practices in the United States.
Analyze the marketing variables of product, promotion, placement, and price in the context of strategic planning, implementation, and control.
Examine the consumer behavior process and what, when, why, where, and how consumers choose products and services.
Create an integrated marketing communication strategy to include traditional, social, and digital media elements for application to retail and/or business industries.
Apply professional selling in today's competitive marketplace.
Evaluate the impact of changing global, political, economic, competitive, environmental, cultural and social systems on marketing strategy development.

**Marketing Certificate**

| Marketing Certificate | | |
|---|---|---|
| BA 123 | Business Concepts | 3 |
| MK 203 | Marketing | 3 |
| MK 323 | Integrated Marketing Communication | 3 |
| MK 363/PSY 3063 | Commerce and Consumer Behavior | 3 |
| MK 433 | Marketing Strategy | 3 |
| | Or | |
| MK 423 | Professional Selling | 3 |
| UE 111 | Online Learning Orientation | 1 |

## Organizational Leadership Certificate

With Trine University's online certificate in Organizational Leadership, students will prepare for leadership roles in corporate and non-profit sectors. Organizations in a variety of industries seek leaders who can diagnose problems, motivate and inspire employees, and implement change. Throughout this certificate, students will utilize evidence-based leadership competencies including: critical thinking, interpersonal relations, decision-making and problem-solving. This certificate program will prepare students to advance in the workforce or to pursue a degree. Required coursework for the Organizational Leadership certificate may be applied towards the Bachelor of Science in Organizational Leadership program.

**Outcomes**
Identify leadership skills that can motivate and inspire organizations' members.
Recommend strategies that will positively impact team, culture, and communication efforts within organizations.
Develop strategies for designing a culture that fosters a creative and inclusive team environment.
Analyze the leadership skills needed to effectively lead change.
Apply emotional intelligence practices to organizational leadership.

**Organizational Leadership Certificate**

| Organizational Leadership Certificate | | |
|---|---|---|
| DEI 243 | Organizational Emotional Intelligence | 3 |
| LDR 203 | Leadership Strengths & Skills | 3 |
| LDR 323 | Leading Effective Teams | 3 |
| LDR 333 | Organizational Leadership Development & Change | 3 |
| LDR 343 | Conflict Resolution | 3 |
| UE 111 | Online Learning Orientation | 1 |

# Graduate Programs

**Culture of Graduate Learning**

Graduate learning, teaching and scholarship differ from the undergraduate educational experience through the intensity of learning and the role of applicable research. All graduate experiences should reflect an in-depth study of a particular curricular field and should lead students to independent thinking, learning and knowledge acquisition.

**Affirmative Action Statement**

Trine University is committed to the equitable treatment of students, faculty and staff; therefore, all who work, live, study and teach in the Trine Community will be valued on the basis of scholastic achievement and academic potential without regard to race, religion, color, gender, sexual orientation, or age.

## College of Health Professions

Certificate of Nursing Education

Nursing Informatics Certificate

Master of Science in Nursing

Master of Physicians Assistant Studies

Doctor of Physical Therapy

Doctor of Occupational Therapy

## School of Education Graduate Certificates

**Transition to Teaching Graduate Certificates**

The Trine FSOE Transition to Teaching program is a program for teaching candidates on a temporary teaching contract employed by a partner school. The program is designed to provide an apprenticeship-type experience resulting in rigorous, relevant training aligned to professional duties and the state-required pedagogy exam to earn a teacher certification.

Elementary Education Pedagogy

Secondary Education Pedagogy

Special Education Mild Intervention

**School of Education Graduate Certificates**

The Franks School of Education has designed a series of graduate certificates for in-service educators to earn for knowledge and career advancement. Graduate credit also significantly contribute to state recognized professional growth points (PGP) that are required in the state of Indiana to maintain a teacher’s license. To earn a graduate certificate, students must complete a minimum of 12 graduate credit hours.

Certificates include:

Classroom Behavior and Management (K-12)

Early Childhood Education (EC)

English Language Arts Instruction (K-12)

English Language Learners (K-12)

Instructional Design (K-12)

Special Education: Mild Interventions (K-12)

Trauma-Informed Instruction (P-12)

## Graduate Certificate in Elementary Education Pedagogy

The Trine FSOE Transition to Teaching program is a program for teaching candidates on a temporary teaching contract employed by a partner school. The program is designed to provide an apprenticeship-type experience resulting in rigorous, relevant training aligned to professional duties and the state-required pedagogy exam to earn a teacher certification.

**Degree Requirements**

Professional Education Requirements (24 credit hours)

| | | |
|---|---|---|
| EDU 5101 | The Beginning Teacher | 1 |
| EDU 5112 | The Assessment Cycle I | 2 |
| EDU 5122 | Partnering with Families | 2 |
| EDU 5132 | Expanding the Classroom with Technology | 2 |
| EDU 5142 | The Reflective Teacher | 2 |
| EDU 5152 | The Classroom Environment | 2 |
| EDU 5162 | Deeper Learning Instructional Strategies | 2 |
| EDU 5172 | The Assessment Cycle II | 2 |
| EDU 5182 | Taking the Lead | 2 |
| EDU 5191 | Professional Goal Setting | 1 |
| EDU 5103 | Literacy for the Elementary Teacher I | 3 |
| EDU 5113 | Literacy for the Elementary Teacher II | 3 |

## Graduate Certificate in Secondary Education Pedagogy

The Trine FSOE Transition to Teaching program is a program for teaching candidates on a temporary teaching contract employed by a partner school. The program is designed to provide an apprenticeship-type experience resulting in rigorous, relevant training aligned to professional duties and the state-required pedagogy exam to earn a teacher certification.

**Degree Requirements**

Professional Education Requirements (18 credit hours)

| | | |
|---|---|---|
| EDU 5101 | The Beginning Teacher | 1 |
| EDU 5112 | The Assessment Cycle I | 2 |
| EDU 5132 | Expanding the Classroom with Technology | 2 |
| EDU 5142 | The Reflective Teacher | 2 |
| EDU 5152 | The Classroom Environment | 2 |
| EDU 5162 | Deeper Learning Instructional Strategies | 2 |
| EDU 5172 | The Assessment Cycle II | 2 |
| EDU 5182 | Taking the Lead | 2 |
| EDU 5191 | Professional Goal Setting | 1 |

## Graduate Certificate in Special Education Mild Intervention

The Trine University FSOE Transition to Teaching: Mild Interventions (P-12) program is for teacher candidates on a temporary teaching contract employed by a partner school. The program is designed to provide an apprenticeship-type experience

resulting in rigorous, relevant training aligned to professional duties and the state-required pedagogy and content exams to earn teacher certification.

**Degree Requirements**

Professional Education Requirements (24 hours)

| | | |
|---|---|---|
| EDU 5801 | The Beginning Special Education Teacher | 1 |
| EDU 5803 | Literacy for Students with Mild Exceptional Needs I | 3 |
| EDU 5812 | Building Teams to Support Learners | 2 |
| EDU 5813 | Literacy for Students with Mild Exceptional Needs II | 3 |
| EDU 5822 | Using Assessments to Write IEPs and Goals | 2 |
| EDU 5832 | The Development of Learners with Mild Exceptional Needs | 2 |
| EDU 5842 | Special Education Law | 2 |
| EDU 5852 | Methods of Teaching Learners with Mild Exceptional Needs | 2 |
| EDU 5862 | Strengthening Teams to Support Learners | 2 |
| EDU 5872 | Preparing to Transition Learners | 2 |
| EDU 5882 | Behavioral Analysis of Learners with Mild Exceptional Needs | 2 |
| EDU 5891 | Transitioning Learners with Mild Exceptional Needs | 1 |

## Classroom Behavior and Management (K-12)

**Degree Requirements**

Requirements List - Need to complete all 13 credits in the following:

| | | |
|---|---|---|
| EDUV 5002 | Advanced Classroom Management: Children as Change Agents (K-12) | 2 |
| EDUV 5003 | Behavior is Language: Strategies for Managing Disruptive Behavior (5-12) | 3 |
| EDUV 5082 | Harassment, Bullying & Cyber-Intimidation in Schools (K-12) | 2 |
| EDUV 5203 | Understanding Aggression: Coping with Aggressive Behavior in the Classroom (P-12) | 3 |
| EDUV 5303 | Violence in Schools: Identification, Prevention & Intervention Strategies (P-12) | 3 |

## Early Childhood Education (EC)

**Degree Requirements**

Requirements List - Need to complete all 13 credits in the following:

| | | |
|---|---|---|
| EDUV 5013 | Early Childhood: Observation & Assessment (EC) | 3 |
| EDUV 5023 | Early Childhood: Program Planning (EC) | 3 |
| EDUV 5033 | Early Childhood: Typical & Atypical Development (EC) | 3 |
| EDUV 5062 | Early Childhood: Family-Centered Services | 2 |

| | | |
|---|---|---|
| | (EC) | |
| EDUV 5102 | Infant & Toddler Mental Health: Issues & Information for Educators (EC) | 2 |

## English Language Arts Instruction (K-12)

**Degree Requirements**

Requirements List - Need to complete 12 of 17 credits available

| | | |
|---|---|---|
| EDUV 5073 | Reading Fundamentals #3: The Elements of Effective Reading Instruction & Assessment (K-12) | 3 |
| EDUV 5103 | Try DI!: Planning & Preparing a Differentiated Instruction Program (K-12) | 3 |
| EDUV 5202 | Reading & Writing in Content Area (5-12) | 2 |
| EDUV 5302 | Reading Fundamentals #1: An Introduction to Scientifically-based Research (K-6) | 2 |
| EDUV 5402 | Reading Fundamentals #2: Laying the Foundation for Effective Reading Instruction (K-6) | 2 |
| EDUV 5403 | Why DI?: An Introduction to Differentiated Instruction (K-8) | 3 |
| EDUV 5502 | Six Traits of Writing Model: Teaching & Assessing (P-12) | 2 |

## English Language Learners (K-12)

**Degree Requirements**

Requirements List - Need to complete 12 of 19 credits available

| | | |
|---|---|---|
| EDUV 5043 | English Language Learner: Language Acquisition (K-12) | 3 |
| EDUV 5053 | English Language Learner: Methods & Materials (K-12) | 3 |
| EDUV 5202 | Reading & Writing in Content Area (5-12) | 2 |
| EDUV 5403 | Why DI?: An Introduction to Differentiated Instruction (K-8) | 3 |
| EDUV 5503 | English Language Learner: Evaluation & Assessment (K-12) | 3 |
| EDUV 5603 | English Language Learner: Linguistics (K-12) | 3 |
| EDUV 5702 | Teaching Diversity: Influences & Issues in the Classroom (K-12) | 2 |

## Instructional Design (K-12)

**Degree Requirements**

Requirements List - Need to complete 12 of 28 credits available

| | | |
|---|---|---|
| EDUV 5002 | Advanced Classroom Management: Children as Change Agents (K-12) | 2 |
| EDUV 5032 | Build School Communities: Brain Smart Classroom Management (K-12) | 2 |

| | | |
|---|---|---|
| EDUV 5072 | Educational Assessment: Assessing Student Learning in the Classroom (K-12) | 2 |
| EDUV 5083 | Response to Intervention: Practical Information for the Classroom Teacher (K-12) | 3 |
| EDUV 5092 | Inclusion: Working with Students with Special Needs in General Education Classrooms (K-12) | 2 |
| EDUV 5093 | Teaching Secondary Math Conceptually: Meeting Mathematics Standards (5-12) | 3 |
| EDUV 5103 | Try DI!: Planning & Preparing a Differentiated Instruction Program (K-12) | 3 |
| EDUV 5112 | Understanding & Implementing Common Core Standards (K-12) | 2 |
| EDUV 5202 | Reading & Writing in Content Area (5-12) | 2 |
| EDUV 5403 | Why DI?: An Introduction to Differentiated Instruction (K-8) | 3 |
| EDUV 5802 | Teaching Elementary Math Conceptually: A New Paradigm (K-6) | 2 |
| EDUV 5602 | Talented & Gifted: Working with High Achievers (K-6) | 2 |

## Special Education: Mild Interventions (K-12)

**Degree Requirements**

Requirements List - Need to complete 12 of 19 credits available

| | | |
|---|---|---|
| EDUV 5003 | Behavior is Language: Strategies for Managing Disruptive Behavior (5-12) | 3 |
| EDUV 5012 | Attention Deficit/Hyperactivity Disorder: Information & Interventions for Effective Teaching (K-6) | 2 |
| EDUV 5022 | Autism & Asperger's Disorder: Information & Effective Intervention Strategies (K-12) | 2 |
| EDUV 5062 | Early Childhood: Family-Centered Services (EC) | 2 |
| EDUV 5063 | Learning Disabilities: Practical Information for the Classroom Teacher (K-12) | 3 |
| EDUV 5083 | Response to Intervention: Practical Information for the Classroom Teacher (K-12) | 3 |
| EDUV 5092 | Inclusion: Working with Students with Special Needs in General Education Classrooms (K-12) | 2 |
| EDUV 5902 | Traumatized Child: The Effects of Stress, Trauma & Violence on Student Learning (P-12) | 2 |

## Trauma-Informed Instruction (P-12)

**Degree Requirements**

Requirements List - Need to complete 12 of 17 credits available

| | | |
|---|---|---|
| EDUV 5003 | Behavior is Language: Strategies for Managing Disruptive Behavior (5-12) | 3 |
| EDUV 5042 | Child Abuse: Working with Abused & | 2 |

| | | |
|---|---|---|
| | Neglected Children (P-12) | |
| EDUV 5052 | Drugs & Alcohol in Schools: Understanding Substance Use & Abuse (5-12) | 2 |
| EDUV 5102 | Infant & Toddler Mental Health: Issues & Information for Educators (EC) | 2 |
| EDUV 5203 | Understanding Aggression: Coping with Aggressive Behavior in the Classroom (P-12) | 3 |
| EDUV 5303 | Violence in Schools: Identification, Prevention & Intervention Strategies (P-12) | 3 |
| EDUV 5902 | Traumatized Child: The Effects of Stress, Trauma & Violence on Student Learning (P-12) | 2 |

## Graduate Certificate in Healthcare Informatics

The Graduate Certificate in Healthcare Informatics offered through the College of Graduate and Professional Studies at Trine University will prepare students for high level positions in the healthcare industry by exposing students to various topics in health informatics, including: health data collection, management, processing, storage, analysis, and development of new products. Additionally, students will develop their healthcare informatics skills by using tools such as Electronic Health Records (EHR), the latest advances in Health Information Technologies (HIT), and Health Information Privacy and Health Data Security. The certificate program will prepare students to advance in the workforce or to pursue a master's program, such as a Master of Science in Healthcare Informatics.

**Outcomes**

Compare the relationship between informatics and healthcare.
Measure the role of informatics in diagnostics and medical management through medical terminology, diagnostic and treatment modalities, and patient privacy and security.
Predict health outcomes of individuals, organizations, and communities using large data systems.
Adopt new technologies to improve care processes in healthcare using diverse and multicultural perspectives.
Adapt effective communication skills needed to present, propose and negotiate ideas to varying stakeholders.
Solve health and biomedical informatics problems by integrating information technology, analytics, human behavior, and health management theories.

**Graduate Certificate in Healthcare Informatics**

Program Requirements

| | | |
|---|---|---|
| GE 5103 | Project Management | 3 |
| IS 5113 | Data Mining & Data Visualization | 3 |
| IS 5213/DIT 7023 | Data Science & Big Data | 3 |
| HCI 5003 | Intro to Health Informatics | 3 |
| HCI 5013 | Health Research and Analytics | 3 |
| HCI 5023 | Interoperability Healthcare & Data | 3 |

## Master of Education in Early Childhood Montessori Education (34 hrs.)

The Master of Education in Early Childhood Montessori Education consists of eight weeks of full-time coursework and a nine-month clinical practicum in a Montessori classroom under the guidance of an experienced Montessori guide, with supporting guidance and additional academic content from Trine. Teacher candidates will be instructed in all academic and theoretical aspects of Montessori early childhood education, including child development and the use of Montessori hands-on materials for learning.

**Accreditation**

The Center for Montessori Education at Trine University is an application for accreditation with the Montessori Accreditation

Council for Teacher Education, which provides rigorous standards for effective preparation of Montessori teachers. Applicant for accreditation status in no way determines the outcome of the accreditation decision by MACTE. More information may be found at http://www.macte.org.

The Master of Education in Early Childhood Montessori Education program is pending 2021 approval by the Higher Learning Commission.

**Mission**

**Franks School of Education Mission:** The mission of the Montessori Teacher Education Program in the Franks School of Education at Trine University is to advance equitable access to Montessori teacher preparation that elevates the child to the center of learning and the prepared environment to the center of engagement.

**The Center for Montessori Education Mission:** The mission of The Center for Montessori Education at Trine University is to advance equitable access to Montessori teacher preparation that elevates the child to the center of learning and the prepared environment to the center of engagement.

**Program Objectives**

FSOE PROGRAM OBJECTIVES

1. **Learner Development**. The teacher candidate understands how learners grow and develop, recognizing that patterns of learning and development vary individually within and across the cognitive, linguistic, social, emotional, and physical areas, and designs and implements developmentally appropriate and challenging learning experiences.

2. **Learning Differences**. The teacher candidate uses understanding of individual differences and diverse cultures and communities to ensure inclusive learning environments that enable each learner to meet high standards.

3. **Learning Environments**. The teacher candidate works with others to create environments that support individual and collaborative learning, and that encourage positive social interaction, active engagement in learning, and self-motivation.

4. **Content Knowledge**. The teacher candidate understands the central concepts, tools of inquiry, and structures of discipline(s) he or she teaches and creates learning experiences that make the discipline accessible and meaningful for learners to assure mastery of the content.

5. **Application of Content**. The teacher candidate understands how to connect concepts and use differing perspectives to engage learners in critical thinking, creativity, and collaborative problem solving related to authentic local and global issues.

6. **Assessment**. The teacher candidate understands and uses multiple methods of assessment to engage learners in their own growth, to monitor learner progress, and to guide the teacher's and learner's decision making.

7. **Planning for Instruction**. The teacher candidate plans instruction that supports every student in meeting rigorous learning goals by drawing upon knowledge of content areas, curriculum, cross-disciplinary skills, and pedagogy, as well as knowledge of learners and the community context.

8. **Instructional Strategies**. The teacher candidate understands and uses a variety of instructional strategies to encourage learners to develop deep understanding of content areas and their connections, and to build skill to apply knowledge in meaningful ways.

9. **Professional Learning and Ethical Practice**. The teacher candidate engages in ongoing professional learning and uses evidence to continually evaluate his/her practice, particularly the effects of his/her choices and actions on others (learners, families, other professionals, and the community), and adapts practice to meet the needs of each learner.

10. **Leadership and Collaboration**. The teacher candidate seeks appropriate leadership roles and opportunities to take responsibility for student learning and development, to collaborate with learners, families, colleagues, other school professionals, and community members to ensure learner growth, and to advance the profession.

**MACTE Montessori accrediting body Competencies**

MACTE (Montessori accrediting body) COMPETENCIES

**I. Content Knowledge**
1a. Montessori Philosophy
1b. Human Growth and Development
1c. EC Practical Life Subject Matter

**II. Pedagogical Knowledge**
2a. Correct use of Montessori materials
2b. Scope and sequence of curriculum (spiral curriculum)
2c. The prepared environment
2d. Parent/Teacher/Family/Community partnership
2e. The purpose and methods of observation
2f. Planning for instruction
2g. Assessment and documentation
2i. Support and intervention for learning differences
2j. Culturally responsive methods

**III. Practice**
3a. Classroom leadership
3b. Authentic assessment
3c. Montessori philosophy and methods (materials)
3d. Professional responsibilities

**Degree Requirements**

Required

| | | |
|---|---|---|
| EDU 5012 | Montessori Philosophy/Theory/Peace Education | 2 |
| EDU 5013 | Montessori Cultural Studies Curriculum (Physical/Life Science and Social Studies Curriculum) | 3 |
| EDU 5022 | Montessori Practical Life/Everyday Living Curriculum | 2 |
| EDU 5023 | Montessori Art, Music & Movement Curriculum | 3 |
| EDU 5032 | Montessori Sensorial Curriculum | 2 |
| EDU 5033 | Montessori Classroom Leadership | 3 |
| EDU 5042 | Montessori Language Curriculum | 2 |
| EDU 5043 | Montessori Early Childhood Practicum Teaching I | 3 |
| EDU 5052 | Montessori Math Curriculum | 2 |
| EDU 5053 | Montessori Early Childhood Practicum Teaching II | 3 |
| EDU 5062 | Montessori Child Development/Psychology | 2 |
| EDU 5072 | Montessori Early Childhood Practicum Seminar I | 2 |
| EDU 5082 | Montessori Early Childhood Practicum Seminar II | 2 |
| EDU 5333 | Research Methods | 3 |

# Master of Education in Elementary I Montessori Education

The Master of Education in Elementary I Montessori Education program consists of six weeks of full time coursework with an additional four weekends of study and a nine-month clinical practicum in a Montessori classroom. Teacher candidates will be instructed in all academic and theoretical aspects of Montessori Elementary I education including child development and the use of Montessori hands-on materials for learning.

**Accreditation**

The Center for Montessori Education at Trine University is in application for accreditation with the Montessori Accreditation Council for Teacher Education, which provides rigorous standards for effective preparation of Montessori teachers. Applicant for accreditation status in no way determines the outcome of the accreditation decision by MACTE. More information may be found at http://www.macte.org.

**Mission**

**Franks School of Education Mission:** The mission of the Montessori Teacher Education Program in the Franks School of Education at Trine University is to advance equitable access to Montessori teacher preparation that elevates the child to the center of learning and the prepared environment to the center of engagement.

**The Center for Montessori Education Mission:** The mission of The Center for Montessori Education at Trine University is to advance equitable access to Montessori teacher preparation that elevates the child to the center of learning and the prepared environment to the center of engagement.

**Program Objectives**

FSOE PROGRAM OBJECTIVES

1. **Learner Development**. The teacher candidate understands how learners grow and develop, recognizing that patterns of learning and development vary individually within and across the cognitive, linguistic, social, emotional, and physical areas, and designs and implements developmentally appropriate and challenging learning experiences.
2. **Learning Differences**. The teacher candidate uses understanding of individual differences and diverse cultures and communities to ensure inclusive learning environments that enable each learner to meet high standards.
3. **Learning Environments**. The teacher candidate works with others to create environments that support individual and collaborative learning, and that encourage positive social interaction, active engagement in learning, and self-motivation.
4. **Content Knowledge**. The teacher candidate understands the central concepts, tools of inquiry, and structures of discipline(s) he or she teaches and creates learning experiences that make the discipline accessible and meaningful for learners to assure mastery of the content.
5. **Application of Content**. The teacher candidate understands how to connect concepts and use differing perspectives to engage learners in critical thinking, creativity, and collaborative problem solving related to authentic local and global issues.
6. **Assessment**. The teacher candidate understands and uses multiple methods of assessment to engage learners in their own growth, to monitor learner progress, and to guide the teacher’s and learner’s decision making.
7. **Planning for Instruction**. The teacher candidate plans instruction that supports every student in meeting rigorous learning goals by drawing upon knowledge of content areas, curriculum, cross-disciplinary skills, and pedagogy, as well as knowledge of learners and the community context.
8. **Instructional Strategies**. The teacher candidate understands and uses a variety of instructional strategies to encourage learners to develop deep understanding of content areas and their connections, and to build skill to apply knowledge in meaningful ways.

9. **Professional Learning and Ethical Practice**. The teacher candidate engages in ongoing professional learning and uses evidence to continually evaluate his/her practice, particularly the effects of his/her choices and actions on others (learners, families, other professionals, and the community), and adapts practice to meet the needs of each learner.

10. **Leadership and Collaboration**. The teacher candidate seeks appropriate leadership roles and opportunities to take responsibility for student learning and development, to collaborate with learners, families, colleagues, other school professionals, and community members to ensure learner growth, and to advance the profession.

**MACTE Montessori accrediting body Competencies**

MACTE (Montessori accrediting body) COMPETENCIES

**I. Content Knowledge**
1a. Montessori Philosophy
1b. Human Growth and Development
1c. EC Practical Life Subject Matter

**II. Pedagogical Knowledge**
2a. Correct use of Montessori materials
2b. Scope and sequence of curriculum (spiral curriculum)
2c. The prepared environment
2d. Parent/Teacher/Family/Community partnership
2e. The purpose and methods of observation
2f. Planning for instruction
2g. Assessment and documentation
2i. Support and intervention for learning differences
2j. Culturally responsive methods

**III. Practice**
3a. Classroom leadership
3b. Authentic assessment
3c. Montessori philosophy and methods (materials)
3d. Professional responsibilities

**Montessori Elementary I (36 hrs.)**

Academic Phase (23 hrs.)

| | | |
|---|---|---|
| EDU 5601 | Montessori E-I Movement, Art and Music Curriculum I | 1 |
| EDU 5603 | Montessori E-I EC Overview | 3 |
| EDU 5611 | Montessori E-I Movement, Art and Music Curriculum II | 1 |
| EDU 5613 | Montessori E-I Philosophy/Child Development | 3 |
| EDU 5621 | Montessori E-I Curriculum Design/Classroom Leadership I | 1 |
| EDU 5622 | Montessori E-I Practical Life Curriculum | 2 |
| EDU 5623 | Montessori E-I Cultural Geography Curriculum | 3 |
| EDU 5631 | Montessori E-I Curriculum Design/Classroom Leadership II | 1 |
| EDU 5633 | Montessori E-I Mathematics Curriculum | 3 |
| EDU 5641 | Montessori E-I Geometry Curriculum I | 1 |
| EDU 5651 | Montessori E-I Geometry Curriculum II | 1 |
| EDU 5653 | Montessori E-I Language Curriculum | 3 |

Practicum Phase (13 hours)

| | | |
|---|---|---|
| EDU 5632 | Montessori E-I Practicum Seminar I | 2 |
| EDU 5642 | Montessori E-I Practicum Seminar II | 2 |
| EDU 5663 | Montessori E-I Practicum Teaching I | 3 |
| EDU 5673 | Montessori E-I Practicum Teaching II | 3 |
| LDR 5333 | Research Methods | 3 |

# Master of Education in Elementary I-II Montessori Education

The Master of Education in Elementary I-II Montessori Education program consists of two summers of full time coursework with additional weekend coursework and a nine-month clinical practicum in a Montessori E-I or E-II classroom. Teacher candidates will be instructed in all academic and theoretical aspects of Montessori Elementary I-II education including child development and the use of Montessori hands-on materials for learning.

**Professional Commitments and Dispositions**

The Franks School of Education has adopted the principles developed by the Council of Chief State School Officers (CCSSO) and the Interstate Teacher Candidate Assessment and Support Consortium (InTASC) as program performance learning outcomes (PO). This set of model core teaching standards outlines what teachers should know and be able to do to ensure every P-12 student succeeds.

1. **Learner Development**. The teacher candidate understands how learners grow and develop, recognizing that patterns of learning and development vary individually within and across the cognitive, linguistic, social, emotional, and physical areas, and designs and implements developmentally appropriate and challenging learning experiences.

2. **Learning Differences**. The teacher candidate uses understanding of individual differences and diverse cultures and communities to ensure inclusive learning environments that enable each learner to meet high standards.

3. **Learning Environments**. The teacher candidate works with others to create environments that support individual and collaborative learning, and that encourage positive social interaction, active engagement in learning, and self-motivation.

4. **Content Knowledge**. The teacher candidate understands the central concepts, tools of inquiry, and structures of discipline(s) he or she teaches and creates learning experiences that make the discipline accessible and meaningful for learners to assure mastery of the content.

5. **Application of Content**. The teacher candidate understands how to connect concepts and use differing perspectives to engage learners in critical thinking, creativity, and collaborative problem solving related to authentic local and global issues.

6. **Assessment**. The teacher candidate understands and uses multiple methods of assessment to engage learners in their own growth, to monitor learner progress, and to guide the teacher's and learner's decision making.

7. **Planning for Instruction**. The teacher candidate plans instruction that supports every student in meeting rigorous learning goals by drawing upon knowledge of content areas, curriculum, cross-disciplinary skills, and pedagogy, as well as knowledge of learners and the community context.

8. **Instructional Strategies**. The teacher candidate understands and uses a variety of instructional strategies to encourage learners to develop deep understanding of content areas and their connections, and to build skill to apply knowledge in meaningful ways.

9. **Professional Learning and Ethical Practice**. The teacher candidate engages in ongoing professional learning and uses evidence to continually evaluate his/her practice, particularly the effects of his/her choices and actions on others (learners, families, other professionals, and the community), and adapts practice to meet the needs of each learner.

10. **Leadership and Collaboration**. The teacher candidate seeks appropriate leadership roles and opportunities to take responsibility for student learning and development, to collaborate with learners, families, colleagues, other school

professionals, and community members to ensure learner growth, and to advance the profession.

**Degree Requirements**

Montessori Elementary I Academic Phase (23 hrs)

| | | |
|---|---|---|
| EDU 5601 | Montessori E-I Movement, Art and Music Curriculum I | 1 |
| EDU 5603 | Montessori E-I EC Overview | 3 |
| EDU 5611 | Montessori E-I Movement, Art and Music Curriculum II | 1 |
| EDU 5613 | Montessori E-I Philosophy/Child Development | 3 |
| EDU 5621 | Montessori E-I Curriculum Design/Classroom Leadership I | 1 |
| EDU 5622 | Montessori E-I Practical Life Curriculum | 2 |
| EDU 5631 | Montessori E-I Curriculum Design/Classroom Leadership II | 1 |
| EDU 5623 | Montessori E-I Cultural Geography Curriculum | 3 |
| EDU 5633 | Montessori E-I Mathematics Curriculum | 3 |
| EDU 5641 | Montessori E-I Geometry Curriculum I | 1 |
| EDU 5651 | Montessori E-I Geometry Curriculum II | 1 |
| EDU 5653 | Montessori E-I Language Curriculum | 3 |

Montessori Elementary II Academic Phase (13 hrs)

| | | |
|---|---|---|
| EDU 5701 | Montessori E I-II Curriculum Design and Classroom Leadership I | 1 |
| EDU 5704 | Montessori E I-II Mathematics and Geometry Curriculum | 4 |
| EDU 5711 | Montessori E I-II Practical Life Curriculum | 1 |
| EDU 5712 | Montessori E I-II Language Curriculum | 2 |
| EDU 5713 | Montessori E I-II Cultural Curriculum | 3 |
| EDU 5721 | Montessori E I-II Movement, Art, & Music | 1 |
| EDU 5741 | Montessori E I-II Curriculum Design and Classroom Leadership II | 1 |

Practicum and Placement Phase (15 hrs)

| | | |
|---|---|---|
| EDU 5632 | Montessori E-I Practicum Seminar I | 2 |
| EDU 5642 | Montessori E-I Practicum Seminar II | 2 |
| EDU 5663 | Montessori E-I Practicum Teaching I | 3 |
| EDU 5673 | Montessori E-I Practicum Teaching II | 3 |
| EDU 5731 | Montessori E I-II Practicum Seminar I | 1 |
| EDU 5751 | Montessori E I-II Practicum Seminar II | 1 |
| LDR 5333 | Research Methods | 3 |

## Master of Education in Elementary Pedagogy

The Master of Education in Elementary Pedagogy provides theoretical knowledge and evidence-based skills to enhance the academic and social growth of diverse learners in grades K-6 and develop a personalized portrait of an educator. Areas of concentration include motivation, literacy instruction, partnering with diverse families, assessment, technology, child development, research design, and instructional strategies incorporating creativity, communication, critical thinking, and collaboration.

**Outcomes**

Learner Development. The teacher candidate understands how learners grow and develop, recognizing that patterns of learning and development vary individually within and across the cognitive, linguistic, social, emotional, and physical areas, and designs and implements developmentally appropriate and challenging learning experiences.

Learning Differences. The teacher candidate uses understanding of individual differences and diverse cultures and communities to ensure inclusive learning environments that enable each learner to meet high standards.

Learning Environments. The teacher candidate works with others to create environments that support individual and collaborative learning, and that encourage position social interaction, active engagement in learning, and self-motivation.

Content Knowledge. The teacher candidate understands the central concepts, tools of inquiry, and structures of discipline (s) he or she teaches and creates learning experiences that make the discipline accessible and meaningful for learners to assure mastery of the content.

Application of Content. The teacher candidate understands how to connect concepts and use differing perspectives to engage learners in critical thinking, creativity, and collaborative problem solving related to authentic local and global issues.

Assessment. The teacher candidate understands and uses multiple methods of assessment to engage learners in their own growth, to monitor learner progress, and to guide the teacher's and learner's decision making.

Planning for Instruction. The teacher candidate plans instruction that supports every student in meeting rigorous learning goals by drawing upon knowledge of content areas, curriculum, cross-disciplinary skills, and pedagogy, as well as knowledge of learners and the community context.

Instructional Strategies. The teacher candidate understands and uses a variety of instructional strategies to encourage learners to develop deep understanding of content areas and their connections, and to build skill to apply knowledge in meaningful ways.

Professional Learning and Ethical Practice. The teacher candidate engages in ongoing professional learning and uses evidence to continually evaluate his/her practice, particularly the effects of his/her choices and actions on others (learners, families, other professionals, and the community), and adapts practice to meet the needs of each learner.

Leadership and Collaboration. The teacher candidate seeks appropriate leadership roles and opportunities to take responsibility for student learning and development, to collaborate with learners, families, colleagues, other school professionals, and community members to ensure learner growth, and to advance the profession.

**Master of Education in Elementary Pedagogy Program Requirements**

Degree Requirements

| | | |
|---|---|---|
| EDU 5102 | The Beginning Teacher | 2 |
| EDU 5103 | Literacy for the Elementary Teacher I | 3 |
| EDU 5112 | The Assessment Cycle I | 2 |
| EDU 5113 | Literacy for the Elementary Teacher II | 3 |
| EDU 5122 | Partnering with Families | 2 |
| EDU 5132 | Expanding the Classroom with Technology | 2 |
| EDU 5141 | The Reflective Teacher | 1 |
| EDU 5152 | The Classroom Environment | 2 |
| EDU 5162 | Deeper Learning Instructional Strategies | 2 |
| EDU 5172 | The Assessment Cycle II | 2 |
| EDU 5182 | Taking the Lead | 2 |
| EDU 5191 | Professional Goal Setting | 1 |
| EDU 5213 | How We Relate: The Connections of Educator and Learner Ecosystems | 3 |
| EDU 5223 | How We Interact: The Connections of Learning and Sharing Information | 3 |
| EDU 5233 | How We Assess: The Connections of Learning to Life | 3 |
| EDU 5243 | How We Improve: The Connections of Research and Practice | 3 |

# Master of Education in Secondary Pedagogy

The Master of Education in Secondary Pedagogy provides theoretical knowledge and evidence-based skills to enhance the

academic and social growth of diverse learners in grades 5-12 and develop a personalized portrait of an educator. Areas of concentration include motivation, literacy instruction, partnering with diverse families, assessment, technology, child development, research design, and instructional strategies incorporating creativity, communication, critical thinking, and collaboration.

**Outcomes**

Learner Development. The teacher candidate understands how learners grow and develop, recognizing that patterns of learning and development vary individually within and across the cognitive, linguistic, social, emotional, and physical areas, and designs and implements developmentally appropriate and challenging learning experiences.

Learning Differences. The teacher candidate uses understanding of individual differences and diverse cultures and communities to ensure inclusive learning environments that enable each learner to meet high standards.

Learning Environments. The teacher candidate works with others to create environments that support individual and collaborative learning, and that encourage position social interaction, active engagement in learning, and self-motivation.

Content Knowledge. The teacher candidate understands the central concepts, tools of inquiry, and structures of discipline (s) he or she teaches and creates learning experiences that make the discipline accessible and meaningful for learners to assure mastery of the content.

Application of Content. The teacher candidate understands how to connect concepts and use differing perspectives to engage learners in critical thinking, creativity, and collaborative problem solving related to authentic local and global issues.

Assessment. The teacher candidate understands and uses multiple methods of assessment to engage learners in their own growth, to monitor learner progress, and to guide the teacher's and learner's decision making.

Planning for Instruction. The teacher candidate plans instruction that supports every student in meeting rigorous learning goals by drawing upon knowledge of content areas, curriculum, cross-disciplinary skills, and pedagogy, as well as knowledge of learners and the community context.

Instructional Strategies. The teacher candidate understands and uses a variety of instructional strategies to encourage learners to develop deep understanding of content areas and their connections, and to build skill to apply knowledge in meaningful ways.

Professional Learning and Ethical Practice. The teacher candidate engages in ongoing professional learning and uses evidence to continually evaluate his/her practice, particularly the effects of his/her choices and actions on others (learners, families, other professionals, and the community), and adapts practice to meet the needs of each learner.

Leadership and Collaboration. The teacher candidate seeks appropriate leadership roles and opportunities to take responsibility for student learning and development, to collaborate with learners, families, colleagues, other school professionals, and community members to ensure learner growth, and to advance the profession.

**Master of Education in Secondary Pedagogy Program Requirements**

Degree Requirements

| | | |
|---|---|---|
| EDU 5101 | The Beginning Teacher | 1 |
| EDU 5112 | The Assessment Cycle I | 2 |
| EDU 5122 | Partnering with Families | 2 |
| EDU 5132 | Expanding the Classroom with Technology | 2 |
| EDU 5142 | The Reflective Teacher | 2 |
| EDU 5152 | The Classroom Environment | 2 |
| EDU 5162 | Deeper Learning Instructional Strategies | 2 |
| EDU 5172 | The Assessment Cycle II | 2 |
| EDU 5182 | Taking the Lead | 2 |
| EDU 5191 | Professional Goal Setting | 1 |
| EDU 5213 | How We Relate: The Connections of Educator and Learner Ecosystems | 3 |
| EDU 5223 | How We Interact: The Connections of Learning and Sharing Information | 3 |
| EDU 5233 | How We Assess: The Connections of Learning to Life | 3 |
| EDU 5243 | How We Improve: The Connections of Research and Practice | 3 |

# Master of Education in Special Education Pedagogy

The Master of Education in Special Education Pedagogy provides theoretical knowledge and evidence-based skills to enhance the academic and social growth of diverse learners in P-12 special education and develop a personalized portrait of an educator. Areas of concentration include motivation, literacy instruction, partnering with diverse families, assessment, technology, child development, research design, and instructional strategies incorporating creativity, communication, critical thinking, and collaboration.

**Outcomes**

Learner Development. The teacher candidate understands how learners grow and develop, recognizing that patterns of learning and development vary individually within and across the cognitive, linguistic, social, emotional, and physical areas, and designs and implements developmentally appropriate and challenging learning experiences.

Learning Differences. The teacher candidate uses understanding of individual differences and diverse cultures and communities to ensure inclusive learning environments that enable each learner to meet high standards.

Learning Environments. The teacher candidate works with others to create environments that support individual and collaborative learning, and that encourage position social interaction, active engagement in learning, and self-motivation.

Content Knowledge. The teacher candidate understands the central concepts, tools of inquiry, and structures of discipline (s) he or she teaches and creates learning experiences that make the discipline accessible and meaningful for learners to assure mastery of the content.

Application of Content. The teacher candidate understands how to connect concepts and use differing perspectives to engage learners in critical thinking, creativity, and collaborative problem solving related to authentic local and global issues.

Assessment. The teacher candidate understands and uses multiple methods of assessment to engage learners in their own growth, to monitor learner progress, and to guide the teacher's and learner's decision making.

Planning for Instruction. The teacher candidate plans instruction that supports every student in meeting rigorous learning goals by drawing upon knowledge of content areas, curriculum, cross-disciplinary skills, and pedagogy, as well as knowledge of learners and the community context.

Instructional Strategies. The teacher candidate understands and uses a variety of instructional strategies to encourage learners to develop deep understanding of content areas and their connections, and to build skill to apply knowledge in meaningful ways.

Professional Learning and Ethical Practice. The teacher candidate engages in ongoing professional learning and uses evidence to continually evaluate his/her practice, particularly the effects of his/her choices and actions on others (learners, families, other professionals, and the community), and adapts practice to meet the needs of each learner.

Leadership and Collaboration. The teacher candidate seeks appropriate leadership roles and opportunities to take responsibility for student learning and development, to collaborate with learners, families, colleagues, other school professionals, and community members to ensure learner growth, and to advance the profession.

**Program Requirements (36 hrs.)**

Required Courses

| | | |
|---|---|---|
| EDU 5801 | The Beginning Special Education Teacher | 1 |
| EDU 5803 | Literacy for Students with Mild Exceptional Needs I | 3 |
| EDU 5812 | Building Teams to Support Learners | 2 |
| EDU 5813 | Literacy for Students with Mild Exceptional Needs II | 3 |
| EDU 5822 | Using Assessments to Write IEPs and Goals | 2 |
| EDU 5832 | The Development of Learners with Mild Exceptional Needs | 2 |
| EDU 5842 | Special Education Law | 2 |
| EDU 5852 | Methods of Teaching Learners with Mild Exceptional Needs | 2 |
| EDU 5862 | Strengthening Teams to Support Learners | 2 |
| EDU 5872 | Preparing to Transition Learners | 2 |
| EDU 5882 | Behavioral Analysis of Learners with Mild Exceptional Needs | 2 |

| | | |
|---|---|---|
| EDU 5891 | Transitioning Learners with Mild Exceptional Needs | 1 |
| EDU 5213 | How We Relate: The Connections of Educator and Learner Ecosystems | 3 |
| EDU 5223 | How We Interact: The Connections of Learning and Sharing Information | 3 |
| EDU 5233 | How We Assess: The Connections of Learning to Life | 3 |
| EDU 5243 | How We Improve: The Connections of Research and Practice | 3 |

## Master of Business Administration (30 hrs.)

The Master of Business Administration (MBA) offered through the College of Graduate and Professional Studies at Trine University will prepare students for executive level positions associated with its core courses: communication, finance, statistics, economics, and marketing. In this program, students will develop and demonstrate their business acumen through meaningful and relevant coursework. Additionally, students will choose a specialization in one of the following areas: management, human resource management, marketing, or students can design their own specialization. The well-rounded integration of different fields of study will prepare students to advance in the workforce or to pursue a doctoral program, such as a Ph.D. in Business Administration

**Master of Business Administration (30 hrs.)**

Program Core Courses - 21 hrs.

| | | |
|---|---|---|
| BA 5223 | Executive Communication | 3 |
| FIN 5063 | Corporate Finance | 3 |
| AC 5023 | Managerial Accounting for MBA | 3 |
| MK 6943 | Strategic Marketing Management | 3 |
| ECO 5033 | Micro & Macro Economic Decision Making | 3 |
| BA 6933 | Statistics & Quantitative Methods | 3 |
| BA 6963 | Business Administration Capstone | 3 |

Option 1: Self-Design

Students can choose from 9 credit hours below, or courses in other MBA concentration options with the approval of the adviser.

| | | |
|---|---|---|
| GE 5103 | Project Management | 3 |
| GE 5113 | New Product Development & Innovation Strategies | 3 |
| GE 5133 | Lean Six Sigma | 3 |
| BA 5103 | Business Ethics | 3 |
| HR 5923 | Strategic Human Resources Management | 3 |
| LDR 5063 | Organizational Development and Change | 3 |
| MK 6513 | Services Marketing | 3 |
| MK 6523 | Sales Management | 3 |
| BAN 5003 | Operations Analytics | 3 |

Option 2: Management

| | | |
|---|---|---|
| GE 5103 | Project Management | 3 |
| GE 5113 | New Product Development & Innovation Strategies | 3 |
| GE 5133 | Lean Six Sigma | 3 |
| | Or | |
| BA 5103 | Business Ethics | 3 |

Option 3: Human Resource Management

| | | |
|---|---|---|
| HR 5923 | Strategic Human Resources Management | 3 |
| LDR 5063 | Organizational Development and Change | 3 |
| BA 5103 | Business Ethics | 3 |

Option 4: Marketing

| | | |
|---|---|---|
| MK 6513 | Services Marketing | 3 |
| MK 6523 | Sales Management | 3 |
| BAN 5003 | Operations Analytics | 3 |

**Outcomes**

Adapt effective communication skills needed to present, propose, and negotiate ides to varying stakeholders.
Recommend solutions to organizational challenges based on qualitative and quantitative analysis.
Develop processes to enhance organizational efficiency using tools from various areas of business.
Apply systems thinking and ethical practices to organizational decision making.
Improve organizational decisions using diversity and multicultural perspectives.

## Master of Business Administration with a Major in Management Science

Trine University's Master of Business Administration with a Major in Management Science offered through the College of Graduate and Professional Studies is designed for individuals aspiring to elevate their careers in science, technology, engineering, and mathematics-related industries. The program blends core business disciplines with specialized STEM-focused courses, providing a comprehensive understanding of both domains.

The STEM principles prepares students to take on leadership roles in various sectors, driving innovation and sustainable growth while navigating the challenges of technology-driven business environments. Students have the option to choose a specialization in Accounting, Analytics, Finance, Healthcare Informatics, Clinical Research, or a Self-Design option.

**Degree Requirements**

Program Core Courses - 21 hours

| | | |
|---|---|---|
| BA 5223 | Executive Communication | 3 |
| FIN 5063 | Corporate Finance | 3 |
| AC 5023 | Managerial Accounting for MBA | 3 |
| MK 6943 | Strategic Marketing Management | 3 |
| ECO 5033 | Micro & Macro Economic Decision Making | 3 |
| BA 6933 | Statistics & Quantitative Methods | 3 |
| BA 6963 | Business Administration Capstone | 3 |

Option 1: Self-Design (Choose 9 credits from program electives below)

| | | |
|---|---|---|
| AC 5003 | Advanced Auditing | 3 |
| AC 533 | Corporate Taxation | 3 |
| AC 553 | Federal Taxation of Pass-Through Entities | 3 |
| BA 6953 | Managing Business Information Systems | 3 |
| BAN 5003 | Operations Analytics | 3 |
| BAN 5023 | Data Driven Decision-Making | 3 |
| FIN 5823 | Financial Modeling | 3 |
| FIN 5843 | Financial Markets & Institutions | 3 |
| FIN 5853 | Investment Analysis & Portfolio Management | 3 |
| HCI 5003 | Intro to Health Informatics | 3 |
| HCI 5013 | Health Research and Analytics | 3 |
| HCI 5023 | Interoperability Healthcare & Data | 3 |
| CR 5003 | Principles of Clinical Research | 3 |
| CR 5013 | Clinical Regulatory Affairs | 3 |
| CR 5023 | Managing & Monitoring Clinical Trials | 3 |

Option 2: Accounting

| | | |
|---|---|---|
| AC 5003 | Advanced Auditing | 3 |
| AC 533 | Corporate Taxation | 3 |
| AC 553 | Federal Taxation of Pass-Through Entities | 3 |

Option 3: Analytics

| | | |
|---|---|---|
| BA 6953 | Managing Business Information Systems | 3 |
| BAN 5003 | Operations Analytics | 3 |
| BAN 5023 | Data Driven Decision-Making | 3 |

Option 4: Finance

| | | |
|---|---|---|
| FIN 5823 | Financial Modeling | 3 |
| FIN 5843 | Financial Markets & Institutions | 3 |
| FIN 5853 | Investment Analysis & Portfolio Management | 3 |

Option 5: Healthcare Informatics

| | | |
|---|---|---|
| HCI 5003 | Intro to Health Informatics | 3 |
| HCI 5013 | Health Research and Analytics | 3 |
| HCI 5023 | Interoperability Healthcare & Data | 3 |

Option 6: Clinical Research

| | | |
|---|---|---|
| CR 5003 | Principles of Clinical Research | 3 |
| CR 5013 | Clinical Regulatory Affairs | 3 |
| CR 5023 | Managing & Monitoring Clinical Trials | 3 |

**Outcomes**

Apply business principles and managerial skills in technology-driven environments to drive organizational success.
Use effective communication to deliver complex technical information.
Utilize advanced quantitative and qualitative analytical skills for effective decision-making in STEM domains.
Develop solutions to complex problems by leveraging technological and scientific knowledge.
Recommend improvements for leading teams in STEM environments.
Support sustainable business practices in STEM fields.

## Master of Science in Artificial Intelligence

The Master of Science in Artificial Intelligence (MSAI) is designed to equip students with the necessary skills and expertise to excel in the rapidly evolving field of artificial intelligence. The program integrates theoretical foundations, practical applications, and in-depth research, providing students with a deep understanding of AI algorithms, machine learning techniques, natural language processing, computer vision, and other key areas.

The MSAI program offers a multidisciplinary curriculum that combines computer science, mathematics, statistics, and cognitive science. Students will explore the theories of AI using tools and technologies, while developing critical thinking skills to solve complex AI challenges. The program also emphasizes ethical considerations in AI development and deployment, ensuring that graduates are equipped to navigate societal implications of AI.

**Master of Science in Artificial Intelligence (30 hrs.)**

Program Requirements (30 hrs.)

| | | |
|---|---|---|
| BA 6933 | Statistics & Quantitative Methods | 3 |
| GE 5103 | Project Management | 3 |
| IS 5213/DIT 7023 | Data Science & Big Data | 3 |

| | | |
|---|---|---|
| AI 5123 | Foundations of Artificial Intelligence | 3 |
| AI 5143 | Natural Language Processing | 3 |
| AI 5163 | AI Ethics & Responsibilities | 3 |
| AI 5183 | Deep Learning | 3 |
| AI 5223 | Machine Learning | 3 |
| AI 5253 | Algorithm Design & Analysis | 3 |
| AI 5273 | AI Capstone Project | 3 |

# Master of Science in Business Analytics (30 hrs.)

The Master of Science in Business Analytics is offered through the College of Graduate and Professional Studies. The program is a combination of hard and soft skills expected to improve the short and long-term career opportunities of the business analyst graduate. The Master of Science in Business Analytics prepares individuals to apply data science to generate insights from data and identify and predict trends. Lastly, it is a program designed to prepare individuals to apply data science to solve business challenges.

Experiential Track In the Experiential Track, an internship experience is an integral part of the program of study. Therefore, international students (F-1) admitted to the Experiential Track are required to be enrolled immediately in an internship course for credit, and be engaged in an active internship experience, whether full or part-time.

Non-Experiential Track In the Non-Experiential Track, international graduate students (F-1) must have been enrolled for one academic year in order to apply for work/internship authorization (CPT).

**Program Educational Objectives**

The program has established the following educational objectives:

1. To prepare students to employ technical expertise in collecting, analyzing, and interpreting data
2. To examine how data analyses are used to develop strategic business insights and decisions
3. To apply the basic skills of computer science fundamentals using a breadth of tools, data sources, and analytical techniques
4. To equip students with a depth of financial acumen for planning, accounting and analysis
5. To produce students who are prepared to present and communicate information for decision making purposes
6. To provide insights and understanding of business operations to develop the student’s ability to identify trends and patterns and answer a wide range of business questions
7. To Show the student how and why leadership and teamwork skills are essential in today’s workplace

**Program Learning Outcomes**

1. Evaluate methods and technologies to organize and normalize data for statistical analysis
2. Assess the project management cycle from initial implementation through project delivery
3. Communicate effectively in multiple forms (oral, written, and graphically)
4. Analyze key performance indicators (KPI), financial reports, and predictive modeling using software applications
5. Solve supply chain, logistics, production and process problems using business analytics theories
6. Use statistics to create regression models, develop data models for forecasting and profit planning

**Degree Requirements**

Program Requirements

| | | |
|---|---|---|
| GE 5103 | Project Management | 3 |
| BA 6933 | Statistics & Quantitative Methods | 3 |
| BAN 5003 | Operations Analytics | 3 |
| BAN 5013/DIT 7033 | Analytics Software & Tools | 3 |
| IS 5113 | Data Mining & Data Visualization | 3 |
| IS 5213/DIT 7023 | Data Science & Big Data | 3 |
| FIN 5063 | Corporate Finance | 3 |
| FIN 5823 | Financial Modeling | 3 |
| BAN 5023 | Data Driven Decision-Making | 3 |
| BAN 6093 | Business Analytics Capstone | 3 |

## Master of Science in Engineering Management (30 hrs.)

Trine University will prepare learners enrolled in the Master of Science in Engineering Management (MSEM) program for various leadership, management, and technical roles in technology, engineering, research and development, industrial and manufacturing organizations. The MSEM program offers three specializations from which students may choose: Operational Excellence (OPEX), Systems Engineering (SE), and a self-designed option comprised of both OPEX and SE courses.

Trine University MSEM graduates will "succeed, lead, and serve," in their future employment through the application of project management, new product innovation and development, statistical analysis, and organizational leadership. A core of seven courses is required for every MSEM student including the foundations of executive communication, Total Quality Management (TQM), and a comprehensive capstone project which serves a culmination of the knowledge and skills acquired through the MSEM program.

Students pursuing the OPEX specialization will also apply Continuous Process Improvement (CPI) methodologies, advanced plant management, and operations strategy to create and foster enduring success applicable in any business sector. Students pursuing the SE specialization will emerge from the program with a comprehensive knowledge of the Systems Engineering process and the ability to apply Model Based Systems Engineering (MBD) as well as operate and manage Systems Testing and Validation events.

**Outcomes**

Demonstrate executive-level oral and written communication.
Demonstrate effective organizational leadership practices and techniques.
Apply PMBOK-based Project Management processes and tools.
Apply new product development and innovation processes, strategies and methods.
Analyze data using statistical and quantitative methods in order to make decisions.
Evaluate existing business and manufacturing processes using Total Quality Management concepts.

**Degree Requirements**

Core Courses - 21 Hours

| | | |
|---|---|---|
| BA 5223 | Executive Communication | 3 |
| BA 6933 | Statistics & Quantitative Methods | 3 |
| GE 5113 | New Product Development & Innovation Strategies | 3 |
| GE 5103 | Project Management | 3 |
| GE 5213 | Total Quality Management | 3 |
| LDR 5113 | Organizational Leadership for Engineers | 3 |

| | | |
|---|---|---|
| GE 6963 | Engineering Management Capstone | 3 |

Specialization Options – 9 hours

Option 1: Self-Design (Choose 9 credits from program electives below)

| | | |
|---|---|---|
| GE 5093 | Design Thinking | 3 |
| GE 5133 | Lean Six Sigma | 3 |
| MGT 5013 | Advanced Plant Management | 3 |
| MGT 543 | Operations Strategy & Management | 3 |
| SYS 5013 | Systems Engineering Analysis | 3 |
| SYS 5113 | Systems Validation and Testing | 3 |
| SYS 5213 | Model Based Systems Engineering | 3 |

Option 2: Systems Engineering (SE)

| | | |
|---|---|---|
| SYS 5013 | Systems Engineering Analysis | 3 |
| SYS 5113 | Systems Validation and Testing | 3 |
| SYS 5213 | Model Based Systems Engineering | 3 |

Option 3: Operational Excellence (OPEX)

| | | |
|---|---|---|
| GE 5133 | Lean Six Sigma | 3 |
| | Or | |
| GE 5093 | Design Thinking | 3 |
| | | |
| MGT 5013 | Advanced Plant Management | 3 |
| MGT 543 | Operations Strategy & Management | 3 |

# Master of Science in Information Studies (30 hrs.)

The Master of Science in Information Studies (MSIS) equips students for advanced and executive level careers in technical fields related to enterprise data and information management, cyber-infrastructure, cloud and web technologies, and complex information systems. As modern information systems and technologies are revolutionizing how people live and work, this program builds the knowledge, skills, and abilities to digitally transform business organizations and create optimal business value from a variety of technologies. The MSIS prepares students to lead and manage information technology organizations, projects, and enterprise initiatives involved in network management, database administration, application development and web services, systems engineering, cybersecurity, and cloud-based information systems.

**Outcomes**

Assess complex technology concepts, architectures, and tools to meet the challenges of rapid technology advancements and solve contemporary business requirements through digital transformation initiatives.
Develop leadership skills in information technology strategy, decision making, project management, and operations.
Apply advanced technology skills to design, implement, and support an enterprise information system in a global business organization.
Evaluate information systems to incorporate business ethics, value and effective policy to align with organizational mission and objectives.

**Degree Requirements**

Program Requirements

| | | |
|---|---|---|
| BA 6933 | Statistics & Quantitative Methods | 3 |
| GE 5103 | Project Management | 3 |
| INF 503 | Advanced Database | 3 |
| IS 5103 | Object-Oriented Programming in Java | 3 |
| IS 5203/DIT 7003 | Network Management | 3 |
| IS 5213/DIT 7023 | Data Science & Big Data | 3 |
| IS 5403/DIT 7013 | Cybersecurity | 3 |

| | | |
|---|---|---|
| IS 5503 | Cloud Computing | 3 |
| SYS 5013 | Systems Engineering Analysis | 3 |
| IS 5803 | Information Studies Capstone | 3 |

## Lou Holtz Master of Science in Organizational Leadership (30 hrs.)

Students in the Lou Holtz Master of Science in Organizational Leadership program will apply leadership theory, practical principles, and sound decision-making to evaluate and analyze organizational development, behavior, and improvement. Students will learn to efficiently resolve conflict, communicate effectively, and direct organizations and people through positive and inclusive organizational culture. Students will also examine ethical and socially responsible plans in varied organizations and leadership roles through technology and professional contexts.

**Degree Requirements**

Program Requirements

| | | |
|---|---|---|
| LDR 5003 | Leadership Philosophy | 3 |
| LDR 5023 | Decision Making for Leaders | 3 |
| LDR 5043 | Organizational Systems & Cultures | 3 |
| LDR 5063 | Organizational Development and Change | 3 |
| LDR 5083 | Conflict Resolution for Leaders | 3 |
| LDR 5203 | Leadership Ethics | 3 |
| LDR 5223 | Organizational Communication for Leaders | 3 |
| LDR 5253 | Technology Topics for Leaders | 3 |
| LDR 5333 | Research Methods | 3 |
| LDR 6563 | Organizational Leadership Capstone | 3 |

**Outcomes**

Determine how leaders guide or develop organizational systems and structures.
Justify strategies to resolve conflict and enhance organizational growth.
Examine organizational behavior and its impact on leadership, communication, ethics, and decision-making.
Evaluate leadership influence on positive and inclusive organizational culture.
Interpret leadership theories within professional contexts.
Apply leadership competencies for decision-making and problem-solving using theory and practice.
Recommend technological improvements for leading organizations.

## Master of Science with a Major in Criminal Justice (30 hrs.)

The Master of Science with a major in Criminal Justice (MSCJ) program is offered through the College of Graduate and Professional Studies. It is an accelerated degree program that provides education for both pre- and mid-career individuals serving their communities as law enforcement, corrections, or court practitioners. The curriculum is designed to prepare these professionals to assume key leadership roles within the justice system or the private sector.

The program prepares students to assume key leadership roles as professionals working in fire safety, law enforcement, social work, and other related fields. Students will learn to analyze criminal justice issues and implement change within the criminal justice system by developing skills in program planning and evaluation, policy formation and analysis, and critical thinking.

Designed for working professionals, the program consists of 10 courses offered online or on campus that can be completed in 12 months. Courses consist of eight week terms.

Pursuing this degree could open doors for students to pursue a variety of opportunities. Whether they plan to enhance their career in criminal justice, teach, or pursue their doctorate, a degree from Trine will give students the competitive edge they need to be successful.

The Master of Science with a major in Criminal Justice degree program is open to persons holding bachelor's degrees from regionally accredited institutions of higher learning and those approved by the program director.

An undergraduate degree in criminal justice is preferred; however, if the undergraduate degree is other than criminal justice, a core of criminal justice prerequisite courses may be required. At the discretion of the CGPS Director of Criminal Justice, these course prerequisites may be waived for applicants who have exemplified outstanding academic credentials at the undergraduate level, or for those applicants with a significant amount of documented professional experience with a criminal justice agency.

**Degree Requirements**

| Program Requirements | | |
|---|---|---|
| CRJ 503 | Seminar Law & Social Control | 3 |
| CRJ 513 | Criminology | 3 |
| CRJ 543 | Criminal Justice Research & Writing | 3 |
| CRJ 553 | Applied Statistics for Criminal Justice | 3 |
| CRJ 653 | Crisis Intervention for Law Enforcement | 3 |
| CRJ 663 | Child Welfare and The Family | 3 |
| FPY 613 | Psychopathology | 3 |
| FPY 643 | Victimology | 3 |
| CRJ 593 | Criminal Justice Capstone Preparation | 3 |
| CRJ 683 | Criminal Justice Demonstration Capstone | 3 |

# Doctor of Information Technology (60 hrs.)

This program is designed with the learner in mind, offering insight into the high-level challenges that organizations encounter. Incorporating information technology into real-world scenarios, learners in this program will evaluate the latest advancements in information technology including the development of solutions, the design of new technical advancements, and the identification of real-world challenges in industry. Coursework centers around the management of information systems, development of applications, and management components of information technology. The curriculum focuses on the use of theory and practical experience presented to the learners in a variety of teaching formats. The course delivery methods include simulations, seminars, dissertation, and face-to-face residencies.

**Doctorate of Information Technology (60 hrs.)**

| Program Core Courses (30 credits) | | |
|---|---|---|
| BAN 5013/DIT 7033 | Analytics Software & Tools | 3 |
| IS 5203/DIT 7003 | Network Management | 3 |
| IS 5403/DIT 7013 | Cybersecurity | 3 |
| IS 5213/DIT 7023 | Data Science & Big Data | 3 |
| DIT 7043 | IT for Management | 3 |
| DIT 7053 | IT Procurement Processes | 3 |
| DIT 7063 | IT Project Management | 3 |
| DIT 7073 | Innovations in IT | 3 |
| DIT 7083 | Computer Science with Python | 3 |
| RSH 7093 | Research Statistics for Information Technology | 3 |

| Program Research Courses (12 credits) | | |
|---|---|---|
| RSH 8003 | Quantitative Research Methods | 3 |
| RSH 8013 | Qualitative Research Methods | 3 |
| RSH 8023 | Research Design | 3 |
| RSH 8033 | Advanced Research Methodology | 3 |

| Program Dissertation Courses (18 credits) | | |
|---|---|---|
| DIT 9006 | DIT Research Proposal Preparation | 6 |
| DIT 9016 | DIT Dissertation I | 6 |
| DIT 9026 | DIT Applied Research Project II | 6 |

**Outcomes**

Assess current and emerging technology relevant to business management theory and practice.
Formulate solutions to real-world technology issues common in the operation of an organization.
Apply literary research on information technology to real-world problems found in organizations.
Develop rigorous original research to contribute to existing scholarship in the field.
Create communications for stakeholders through problem statements, approaches and results of research, possible solutions, and final assessments.
Defend ethical responsibilities as a member of society.

# Minors

Trine University minors are open to all Angola campus undergraduate bachelor degree seeking students. Some minors are restricted to specified majors, as indicated in the minor description.

## Accounting Minor (24 hrs.)

**Ketner School of Business**

**Requirements**

Core Courses (18 hrs.)

| | | |
|---|---|---|
| AC 303 | Cost Accounting | 3 |
| AC 323 | Intermediate Accounting I | 3 |
| AC 333 | Intermediate Accounting II | 3 |
| AC 373 | Accounting Information Systems | 3 |
| AC 423 | Personal Income Tax | 3 |
| FIN 413 | Advanced Managerial Finance | 3 |

Accounting or Finance Electives (6 hrs.)

AC or FIN 300 level or above (including graduate courses)

## Aerospace Engineering Minor (27 hrs.)

**Allen School of Engineering and Computing - Mechanical Engineering Department**

The curriculum is designed to prepare students for professional engineering careers in the aerospace industry or for graduate studies in the aeronautical engineering field. A grade of C or better is required in MAE courses in the minor.

**Requirements**

Engineering Science Courses (6 hrs.)

| | | |
|---|---|---|
| ES 253 | Electrical Science | 3 |
| ES 343 | Heat Transfer | 3 |

Mathematics Course (3hrs.)

| | | |
|---|---|---|
| MA 313 | Introduction to Linear Algebra | 3 |

Required Mechanical Engineering Courses (6 hrs.)

| | | |
|---|---|---|
| MAE 3033 | Fluid Dynamics for Mechanical Engineers | 3 |
| MAE 4023 | System Dynamics & Controls | 3 |
| | Or | |
| MAE 453 | Mechanical Vibration | 3 |

Elective Mechanical Engineering Courses (12 hrs.)

| | | |
|---|---|---|
| MAE 473 | Applied Aerodynamics | 3 |
| MAE 483 | Vehicle Structures | 3 |
| MAE 493 | Aerodynamics Laboratory | 3 |
| MAE 4163 | Introduction to Rocket Propulsion | 3 |
| MAE 4173 | Gas Turbines | 3 |
| MAE 4183 | Aircraft Stability & Control | 3 |

# Applied Mathematics Minor (26 hrs.)

**Jannen School of Arts and Sciences - Mathematics and Physics Department**

(FOR STUDENTS WITH ANOTHER MAJOR) A grade of "C" or higher is required for each mathematics course in the minor.

**Requirements**

Complete the following courses (17 hrs.)

| | | |
|---|---|---|
| MA 134 | Calculus I | 4 |
| MA 164 | Calculus II | 4 |
| MA 213 | Calculus III | 3 |
| MA 233 | Differential Equations | 3 |
| MA 313 | Introduction to Linear Algebra | 3 |

Complete one of the following courses (3 hrs.)

| | | |
|---|---|---|
| MA 393 | Probability & Statistics | 3 |
| MA 473 | Graph Theory & Combinatorics | 3 |

Complete two of the following courses (6 hrs.)

| | | |
|---|---|---|
| MA 3093 | Probability | 3 |
| MA 3193 | Financial Mathematics | 3 |
| MA 3293 | Advanced Probability & Statistics | 3 |
| MA 343 | Introduction to Proofs | 3 |
| MA 353 | Vector Analysis | 3 |
| MA 443 | Numerical Analysis | 3 |

# Athletic Training Minor (16 hrs.)

**Rinker-Ross School of Health Sciences - Exercise Science Department**

This minor enables students to gain experiences in athletic training and prepares them for potential certification as a trainer. The student desiring certification must meet the requirements of the NATA, which entails additional coursework and training. Trine University does not certify athletic trainers.

**Requirements**

Core Courses (10 hrs.)

| | | |
|---|---|---|
| EXS 243 | Athletic Training | 3 |
| EXS 423 | Evaluation of Athletic Injuries | 3 |
| EXS 474 | Professional Development in Athletic Training | 4 |

Choose 6 Credit Hours from the following Courses (6 hrs.)

| | | |
|---|---|---|
| EXS 203 | Risk and Sports | 3 |
| EXS 273 | Nutrition | 3 |
| EXS 343 | Principles of Human Performance | 3 |
| SM 393 | Sport Psychology | 3 |
| | Or | |
| | PSY (200 Level or Above) Elective (3) | 3 |

*SM 393: or other PSY 200 level or above*

# Biology Minor (26 hrs.)

**Rinker-Ross School of Health Sciences - Science Department**

**Requirements**

| | | |
|---|---|---|
| Core Courses (23 hrs.) | | |
| BIO 114 | Principles of Biology I | 4 |
| BIO 124 | Principles of Biology II | 4 |
| BIO 154 | Human Body Systems | 4 |
| BIO 274 | General Ecology | 4 |
| BIO 324 | Microbiology | 4 |
| BIO 233 | Cell Biology | 3 |
| Biology Electives (3 hrs.) | | |
| BIO | | 3 |

# Biomechanical Engineering Minor (26 hrs.)

The curriculum is designed to prepare students for professional engineering careers in the related fields of medical device development, orthopedics, prosthetics, and biomechanics. A grade of C or Better is required for BME courses in the minor. The minor is intended for engineering majors.

**Requirements**

| | | |
|---|---|---|
| Engineering Science Courses (7 hrs.) | | |
| ES 141 | Biology for Engineers | 1 |
| ES 213 | Statics | 3 |
| ES 233 | Engineering Materials | 3 |
| Science Course (4 hrs.) | | |
| BIO 384 | Human Anatomy & Physiology I | 4 |
| Biomedical Courses (15-16 hrs.) | | |
| BME 2011 | Intro to BME Programming MATLAB | 1 |
| | Or | |
| MAE 112 | Introduction to MATLAB and Excel | 2 |
| BME 2012 | Intro to Biomedical Engineering | 2 |
| BME 3003 | Musculoskeletal Biomechanics | 3 |
| BME 3103 | Biomaterials | 3 |
| BME 4103 | BME Quality & Regulatory Compliance | 3 |
| BME 4003 | Advanced Topics in Biomechanics | 3 |
| | Or | |
| BME 4223 | Biomedical Applications of VR Design | 3 |

# Bioprocess Engineering Minor (24-25 hrs.)

**Allen School of Engineering and Computing - Chemical Engineering Department**

There is increased focus on optimizing the ability of biological organisms to produce industrially relevant products. Biological engineering techniques are utilized in the production of biofuels, pharmaceuticals, medical devices, food processing, and consumer products. This increased focus from an industrial standpoint has resulted in increased demand for prospective employees that have a strong background in both engineering and life sciences. The curriculum is designed to provide students

with a foundation to pursue a career in these industries.

**Requirements**

Science Courses (12 hrs.)

| | | |
|---|---|---|
| CH 204 | Organic Chemistry I | 4 |
| BIO 324 | Microbiology | 4 |
| BIO 434 | Biochemistry I | 4 |

Engineering Courses (3 hrs.)

| | | |
|---|---|---|
| CHE 303 | Chemical Engineering Fluid Dynamics | 3 |
| | Or | |
| BME 4603 | Bio Fluid Mechanics | 3 |

Choose two of the following 3-Credit Courses (6 hrs.)

| | | |
|---|---|---|
| CHE 4073/BME 4303 | Biochemical Engineering | 3 |
| | Or | |
| BME 4303 | Biochemical Engineering | 3 |
| CHE 4173 | Bio-Separation Processes | 3 |
| BME 4503 | Tissue Engineering | 3 |

Advanced Bio-Elective Courses (3-4 hrs.)

Departmental Approval Needed. Examples include

| | | |
|---|---|---|
| BME 4503 | Tissue Engineering | 3 |
| CHE 4273 | Pharmaceutical Processes | 3 |
| BIO 304 | Plant Biology | 4 |
| BIO 314 | Animal Biology | 4 |
| BIO 233 | Cell Biology | 3 |
| BIO 374 | Forensic Biology | 4 |
| BIO 384 | Human Anatomy & Physiology I | 4 |
| | Or | |
| BIO 444/CH 444 | Biochemistry II | 4 |

# Business Minor (21 hrs.)

**Ketner School of Business**

The business minor is designed for students in a degree program outside of the Ketner School of Business. Prerequisites as shown in the Course Descriptions section of this catalog must be carefully observed.

**Requirements**

Core Courses

| | | |
|---|---|---|
| AC 203 | Accounting I | 3 |
| AC 213 | Accounting II | 3 |
| BA 123 | Business Concepts | 3 |
| FIN 303 | Managerial Finance | 3 |
| LAW 203 | Business Law & Ethics | 3 |
| MGT 363 | Organizational Behavior | 3 |
| MK 203 | Marketing | 3 |

# Chemistry Minor (24 hrs.)

**Rinker-Ross School of Health Sciences - Science Department**

(FOR NON-EDUCATION STUDENTS WITH ANOTHER MAJOR)

**Requirements**

Core Courses (12 hrs.)

| | | |
|---|---|---|
| CH 104 | General Chemistry I | 4 |
| CH 114 | General Chemistry II | 4 |
| CH 234 | Quantitative Chemical Analysis | 4 |

Chemistry Electives (12 hrs.)

| | | |
|---|---|---|
| CH | | 12 |

# Coaching Minor (18 hrs.)

**Rinker-Ross School of Health Sciences - Exercise Science Department**

**Requirements**

Core Course (3 hrs.)

| | | |
|---|---|---|
| EXS 483 | Professional Development in Exercise Science | 3 |

Choose 15 Credits from the following Courses (15 hrs.)

| | | |
|---|---|---|
| BIO 154 | Human Body Systems | 4 |
| EXS 103 | Teaching Sport Skills I | 3 |
| EXS 203 | Risk and Sports | 3 |
| | Or | |
| MGT 303 | Risk Management | 3 |
| EXS 273 | Nutrition | 3 |
| EXS 343 | Principles of Human Performance | 3 |
| EXS 493 | Strength and Conditioning Preparation | 3 |
| LDR 203 | Leadership Strengths & Skills | 3 |
| | Or | |
| MGT 323 | Leadership | 3 |
| SM 393 | Sport Psychology | 3 |

# Communication Minor (15 hrs.)

**Jannen School of Arts and Sciences - Language and Humanities Department**

(FOR A STUDENT WITH ANOTHER MAJOR)

**Requirements**

Core Course (3 hrs.)

| | | |
|---|---|---|
| COM 163 | Interpersonal Communication | 3 |

Communication Electives (12 hrs.)

COM prefix courses with at least six hours at the 300-level or above.

## Criminal Justice Minor (15 hrs.)

**Jannen School of Arts and Sciences - Criminal Justice Department**

(FOR A STUDENT WITH ANOTHER MAJOR)

**Requirements**

| Core Courses (15 hrs.) | | |
|---|---|---|
| CRJ 103 | Introduction to Criminal Justice | 3 |
| CRJ 153 | Juvenile Justice | 3 |
| CRJ 243 | Introduction to Criminology | 3 |
| CRJ 263 | Introduction to Criminal Law & Justice | 3 |
| CRJ 273 | Criminal Procedure & Evidence | 3 |

## Cybersecurity Minor (15 hrs.)

**Allen School of Engineering and Computing - Computer Science & Information Technology Department**

**Requirements**

| Core Courses (15 hrs.) | | |
|---|---|---|
| CSIT 123 | Computing Infrastructure Basics | 3 |
| CSIT 223 | Network Management | 3 |
| INF 343 | Information Security | 3 |
| CSIT 363 | Certified Ethical Hacking I | 3 |
| CSIT 373 | Certified Ethical Hacking II | 3 |

## Data Science Minor (15 hrs.)

**Allen School of Engineering and Computing - Computer Science & Information Technology Department**

(For non-Informatics, non-Computer Information Science, non-Computer Information Systems, non-Computer Science, and non-Computer Science & Information Technology Majors)

**Requirements**

| Core Courses (15 hrs.) | | |
|---|---|---|
| CSIT 103 | Introduction to Information Systems | 3 |
| | Or | |
| BA 113 | Business Computer Applications | 3 |
| INF 263 | Data Management | 3 |
| INF 393 | Data Visualization | 3 |
| INF 433 | Data Mining & Visualization | 3 |
| MA 203 | Discrete Math for Information Sciences | 3 |

## Education Minor (15 hrs.)

**Franks School of Education**

A minor in education provides foundational educational knowledge, skills, and dispositions required in P-12 school settings

to students seeking a non-education program degree.

**Requirements**

| | | |
|---|---|---|
| Complete the following courses (5 hrs.) | | |
| EDU 111 | Education Exploration | 1 |
| EDU 211 | Education Immersion | 1 |
| EDU 273 | Issues in American Education | 3 |
| Complete one of the following courses (2 hrs.) | | |
| EDU 222 | Educational Psychology for the Elementary Teacher | 2 |
| EDU 232 | Educational Psychology for the Middle & Secondary School Teacher | 2 |
| Complete at least 8 credit hours of the following courses: | | |
| EDU 1001 | Montessori Exploration (EL 1) | 1 |
| EDU 181 | Introduction to Teaching Students with Mild Exceptional Needs | 1 |
| EDU 282 | The Development of Students with Mild Except Needs | 2 |
| EDU 312 | Exceptional Learners | 2 |
| EDU 322 | Culturally Responsive Teaching | 2 |
| EDU 353 | Children's Literature | 3 |
| EDU 362 | Classroom Behavior & Environment | 2 |

## Energy Engineering Minor (27 hrs.)

**Allen School of Engineering and Computing - Electrical & Computer Engineering Department**

The minor curriculum is designed to prepare students for professional engineering careers in both the traditional and renewable branches of the electrical energy industry or for graduate studies in the energy field. A grade of C or better is required for all courses in the minor.

**Requirements**

| | | |
|---|---|---|
| Engineering Science Courses (12 hrs.) | | |
| ES 213 | Statics | 3 |
| ES 223 | Dynamics | 3 |
| ES 233 | Engineering Materials | 3 |
| ES 313 | Thermodynamics | 3 |
| Mechanical Engineering Courses (3 hrs.) | | |
| MAE 4023 | System Dynamics & Controls | 3 |
| Electrical Engineering Courses (12 hrs.) | | |
| ECE 213 | Circuit Analysis | 3 |
| | Or | |
| ES 253 | Electrical Science | 3 |
| ECE 303 | Electrical Machines | 3 |
| ECE 313 | Electrical Power | 3 |
| ECE 403 | Direct Generation Techniques | 3 |

# English Minor (15 hrs.)

**Jannen School of Arts and Sciences - Language and Humanities Department**

**Requirements**

Choose two of the five Literature Surveys (6 hrs.)

| | | |
|---|---|---|
| ENG 253 | World Literature | 3 |
| ENG 2013 | British Literature I | 3 |
| ENG 2023 | British Literature II | 3 |
| ENG 2113 | American Literature I | 3 |
| ENG 2123 | American Literature II | 3 |

Choose 9 Credits from the following Courses (9 hrs.)

| | | |
|---|---|---|
| THE 103 | Introduction to Theatre | 3 |
| FLM 203 | Film Appreciation | 3 |
| ENG 153 | Introduction to Literature | 3 |
| ENG | | 3 |

*ENG: 200 level or higher*

# Entrepreneurship Minor for Business Students (24hrs.)

**Ketner School of Business**

The entrepreneurship minor is designed for students who are interested in starting a business. Open to students from any Ketner School of Business program, the entrepreneurship minor uses collaborative, problem-based learning, assessment of learning outcomes, and collaboration among students, faculty, and business partners to deliver a dynamic program. Courses in the entrepreneurship program will help students develop an “entrepreneurial mindset,” so that they can be innovative thinkers and leaders in a startup company or an existing company.

**Requirements**

Core Courses (12 hrs.)

| | | |
|---|---|---|
| ENT 423 | Entrepreneurship & Venture Planning | 3 |
| FIN 323 | Money & Banking | 3 |
| FIN 363 | Venture Finance | 3 |
| MGT 323 | Leadership | 3 |

Select 12 Hours from the following Courses (12 hrs.)

| | | |
|---|---|---|
| AC 423 | Personal Income Tax | 3 |
| FIN 353 | Personal Finance | 3 |
| MGT 313 | Human Resource Management | 3 |
| MGT 333 | Supervision | 3 |
| MGT 443 | Managing Operations | 3 |
| MK 363/PSY 3063 | Commerce and Consumer Behavior | 3 |
| MK 423 | Professional Selling | 3 |
| MK 463 | Marketing Research | 3 |
| MK 473 | Digital Advertising | 3 |

# Entrepreneurship Minor for Non-Business Students (24hrs.)

**Ketner School of Business**

The entrepreneurship minor is designed for non-business students.

**Requirements**

| Core Courses (18 hrs.) | | |
|---|---|---|
| AC 203 | Accounting I | 3 |
| BA 123 | Business Concepts | 3 |
| ENT 423 | Entrepreneurship & Venture Planning | 3 |
| LAW 203 | Business Law & Ethics | 3 |
| MGT 323 | Leadership | 3 |
| MK 203 | Marketing | 3 |

| Select 6 Hours from the following Courses (6 hrs.) | | |
|---|---|---|
| AC 423 | Personal Income Tax | 3 |
| FIN 353 | Personal Finance | 3 |
| MGT 313 | Human Resource Management | 3 |
| MGT 333 | Supervision | 3 |
| MGT 443 | Managing Operations | 3 |
| MK 363/PSY 3063 | Commerce and Consumer Behavior | 3 |
| MK 423 | Professional Selling | 3 |
| MK 463 | Marketing Research | 3 |
| MK 473 | Digital Advertising | 3 |

# Environmental Engineering Minor (27 hrs.)

**Allen School of Engineering and Computing - Civil Engineering Department**

In the past, the environmental impacts of an engineering project or design were considered as an afterthought. Today, environmental concerns strongly influence almost all aspects of engineering practice. The curriculum is designed to provide students with a foundation to pursue a career in environmental engineering and an understanding of the environmental consequences of their designs.

**Requirements**

| Science Courses (11 hrs.) | | |
|---|---|---|
| CH 104 | General Chemistry I | 4 |
| CH 114 | General Chemistry II | 4 |
| ES 323 | Fluid Mechanics | 3 |
| | Or | |
| CHE 303 | Chemical Engineering Fluid Dynamics | 3 |

| Environmental Engineering Breadth Courses (7 hrs.) | | |
|---|---|---|
| CE 3101 | Environmental Engineering Lab | 1 |
| CE 3103 | Environmental Engineering | 3 |
| CE 4103 | Pollution Control Technologies | 3 |

| Choose three of the following 3-Credit Courses Environmental Engineering Depth Courses (9 hrs.) | | |
|---|---|---|
| CE 4113 | Environmental Remediation | 3 |
| CE 4123 | Water & Wastewater Treatment | 3 |
| CE 4333 | Design of Water Distribution Systems & Sewers | 3 |
| CE 4303 | Open Channel Hydraulics | 3 |
| CHE 453 | Chemical Engineering Kinetics | 3 |
| CHE 4073/BME | Biochemical Engineering | 3 |

| | | |
|---|---|---|
| 4303 | | |
| CHE 4083 | Plant Management | 3 |

## Exercise Science Minor (15 hrs.)

**Rinker-Ross School of Health Sciences - Exercise Science Department**

**Requirements**

Core Course (3 hrs.)

| | | |
|---|---|---|
| EXS 483 | Professional Development in Exercise Science | 3 |

Choose 12 Credits from the following (12 hrs.)

| | | |
|---|---|---|
| BIO 154 | Human Body Systems | 4 |
| EXS 102 | Lifetime Wellness | 2 |
| EXS 103 | Teaching Sport Skills I | 3 |
| EXS 273 | Nutrition | 3 |
| EXS 283 | Fitness Evaluation Assessment | 3 |
| EXS 333 | Kinesiology | 3 |
| EXS 353 | Exercise Physiology | 3 |
| EXS 373/AHS 373 | Health Promotion & Problems | 3 |

## Finance Minor (24 hrs.)

**Ketner School of Business**

**Requirements**

Core Courses (12 hrs.)

| | | |
|---|---|---|
| FIN 323 | Money & Banking | 3 |
| FIN 353 | Personal Finance | 3 |
| FIN 403 | Investments | 3 |
| FIN 413 | Advanced Managerial Finance | 3 |

Accounting or Finance Electives (6 hrs.)

AC or FIN Electives 300 level or above (including Graduate courses)

Accounting, Business, Economic, Entrepreneurship, Finance, Management or Marketing Electives (6 hrs.)

AC, BA, ECO, ENT, FIN, MGT, or MK Electives 300 level or above (Including Graduate courses)

## Forensic Psychology Minor (15 hrs.)

**Jannen School of Arts and Sciences - Psychology and Social Sciences Department**

**Requirements**

Core Courses (15 hrs.)

| | | |
|---|---|---|
| PSY 113 | Principles of Psychology | 3 |
| PSY 383 | Forensic Psychology | 3 |
| PSY 443 | Advanced Forensic Psychology | 3 |
| PSY 323 | Abnormal Psychology | 3 |
| CRJ 103 | Introduction to Criminal Justice | 3 |

# Forensic Science Minor (15-17 Hrs.)

**Rinker-Ross School of Health Sciences - Science Department**

The Forensic Science Minor is geared toward students who want to pair a forensic science background with another major. This minor will give students an overview of forensic science in the FS 203 and FS 223 courses and then lets them chose from courses in crime science investigation, psychology, comparative science, forensic chemistry, or forensic biology.

**Requirements**

| Required Forensic Science Courses (6 hrs.) | | |
|---|---|---|
| FS 203 | Principles of Forensic Science I | 3 |
| FS 223 | Principles of Forensic Science II | 3 |

| Choose 3 Courses from the Following (9-11 hrs.) | | |
|---|---|---|
| BIO 374 | Forensic Biology | 4 |
| CH 474 | Forensic Chemistry | 4 |
| CRJ 273 | Criminal Procedure & Evidence | 3 |
| FS 343/CRJ 343 | Criminalistics & Crime Scene Investigations | 3 |
| FS 373 | Forensic Comparative Science | 3 |
| PSY 383 | Forensic Psychology | 3 |

# Thomas and Joy Lacour Golf Management Minor (24 hrs.)

**Ketner School of Business**

**Requirements**

| Core Courses (18 hrs.) | | |
|---|---|---|
| GM 203 | Golf Shop Management | 3 |
| GM 213 | Club Design, Repair & Fitting | 3 |
| GM 323 | Teaching the Golf Swing | 3 |
| MGT 373 | Facility Management | 3 |
| MGT 383 | Principles of Project Management | 3 |
| MGT 403 | Principles of Hospitality Management | 3 |

| Golf Management, Management or Marketing Electives (6 hrs.) | | |
|---|---|---|
| | GM, MGT, or MK Electives 300-400 level | 6 |
| | Or | |
| BA 3113 | Business Internship | 3 |

*BA 3113: Golf Internship and GM, MGT or MK Elective 300-400 level*

# Game Design and Esports Minor (18 hrs.)

**Allen School of Engineering and Computing - Computer Science and Information Technology**

**Requirements**

| Core Courses (15 hours) | | |
|---|---|---|
| CSIT 1013 | Esports Administration | 3 |
| CSIT 1023 | The History of Gaming | 3 |
| CSIT 163 | Using Programming to Solve Problems | 3 |
| CSIT 2013 | Esports Analytics | 3 |
| CSIT 4013 | Game Design and Development | 3 |

Choose one of the following (3 hrs.)

| | | |
|---|---|---|
| CSIT 253 | Artificial Intelligence & Information | 3 |
| COM 243 | Digital Media Creation | 3 |
| EXS 273 | Nutrition | 3 |
| MGT 383 | Principles of Project Management | 3 |
| MK 203 | Marketing | 3 |
| SM 393 | Sport Psychology | 3 |

Please note that MK 203 and MGT 383 have BA 123 as a prerequisite.

## Health Coaching Minor (17 Hrs.)

**Rinker-Ross School of Health Sciences - Exercise Science Department**

The Health Coaching Minor is geared toward students who are looking to develop strong health communication skills and who will be pursuing a health/wellness career involving frequent patient/client interaction. The minor will provide students with an overview of health and wellness knowledge, while also diving deeper into the psychology of behavior change. Students will develop understanding and the communication skills for promoting position behavior change through motivational interviewing and support.

**Requirements**

Required Health Coaching Courses (17 hrs.)

| | | |
|---|---|---|
| EXS 102 | Lifetime Wellness | 2 |
| PSY 113 | Principles of Psychology | 3 |
| EXS 273 | Nutrition | 3 |
| EXS 323 | Performance Nutrition | 3 |
| PSY 363/SOC 363 | Human Behavior & Counseling | 3 |
| EXS 383/AHS 383 | Health Coaching | 3 |

## History Minor (15 hrs.)

**Jannen School of Arts and Sciences - Psychology and Social Sciences Department**

**Requirements**

Choose any 2 of the following history courses (6 hrs.)

| | | |
|---|---|---|
| HIS 103 | American History I | 3 |
| HIS 113 | American History II | 3 |
| HIS 203 | World Civilization I | 3 |
| HIS 213 | World Civilization II | 3 |

History Electives (9 hrs.)

HIS prefix, at least 3 credit hours 300 level or above

## Leadership Minor (24 hrs.)

**Ketner School of Business**

**Requirements**

Core Courses (18 hrs.)

| | | |
|---|---|---|
| COM 163 | Interpersonal Communication | 3 |
| LDR 403 | Creativity, Innovation, and Influence | 3 |

| | | |
|---|---|---|
| LDR 433 | Leadership Practicum | 3 |
| MGT 323 | Leadership | 3 |
| PHL 313 | Ethics | 3 |
| PSY 113 | Principles of Psychology | 3 |

Leadership Electives (6 hrs.)

Choose two courses from the following:

| | | |
|---|---|---|
| BA 333 | Social Media For Business | 3 |
| COM 213 | Business Communication | 3 |
| COM 233 | Intercultural Communication | 3 |
| COM 363 | Rhetoric and Persuasion | 3 |
| COM 413 | Corporate & Organizational Communication | 3 |
| POLS 343 | American Political Thought | 3 |
| POLS 373 | Political Psychology | 3 |
| MGT 313 | Human Resource Management | 3 |
| MGT 333 | Supervision | 3 |
| MGT 343 | Human Resource Development | 3 |
| MGT 363 | Organizational Behavior | 3 |
| MGT 413 | Management Of Quality | 3 |
| MGT 443 | Managing Operations | 3 |
| MGT 453 | Strategic Management | 3 |
| PSY 343 | Social Psychology | 3 |
| PSY 373 | Political Psychology | 3 |
| SM 313 | Principles of Sport & Recreation Management | 3 |
| SM 393 | Sport Psychology | 3 |
| SM 413 | Organization & Administration of Physical Education & Athletics | 3 |

# Management Minor (24 hrs.)

**Ketner School of Business**

**Requirements**

Core Courses (18 hrs.)

| | | |
|---|---|---|
| MGT 313 | Human Resource Management | 3 |
| MGT 323 | Leadership | 3 |
| MGT 353 | Designing Operations | 3 |
| MGT 373 | Facility Management | 3 |
| MGT 383 | Principles of Project Management | 3 |
| MGT 413 | Management Of Quality | 3 |

Electives (6 hrs.)

MGT

# Marketing Minor (18 hrs.)

**Ketner School of Business**

**Requirements**

Core Courses (12 hrs.)

| | | |
|---|---|---|
| BA 123 | Business Concepts | 3 |
| MK 203 | Marketing | 3 |

| | | |
|---|---|---|
| MK 323 | Integrated Marketing Communication | 3 |
| MK 423 | Professional Selling | 3 |

Marketing Electives (6 hrs.)

| | | |
|---|---|---|
| COM 301 | Media Practicum | 1 |
| COM 343 | Web Content Management | 3 |
| COM 353 | Public Relations Writing & Production | 3 |
| COM 363 | Rhetoric and Persuasion | 3 |
| COM 373 | Topics In Communication | 3 |
| COM 383 | Advanced Writing for the Media | 3 |
| COM 413 | Corporate & Organizational Communication | 3 |
| COM 433 | Media Law & Ethics | 3 |
| COM 453 | Public Relations Planning & Campaigns | 3 |
| COM 483 | Public Affairs Reporting | 3 |
| MK 313 | Retail Management | 3 |
| MK 343 | International Marketing | 3 |
| MK 353 | The Global Consumer | 3 |
| MK 363/PSY 3063 | Commerce and Consumer Behavior | 3 |
| MK 373 | Graphic Design Fundamentals | 3 |
| MK 433 | Marketing Strategy | 3 |
| MK 453 | Strategic Digital Marketing Certification | 3 |
| MK 463 | Marketing Research | 3 |
| MK 473 | Digital Advertising | 3 |
| MK 483 | Senior Seminar in Marketing | 3 |
| MK 493 | Selected Topics in Marketing | 3 |
| MK 6943 | Strategic Marketing Management | 3 |

# Metallurgical Engineering Minor (24 – 26 hrs.)

**Allen School of Engineering and Computing - Mechanical Engineering Department**

The curriculum is designed to prepare students for professional engineering careers that require specialized training in metallurgy or for graduate studies in the metallurgical engineering field. A grade of C or better is required for MAE courses in the minor.

**Requirements**

Science Course (3-5 hrs.)

| | | |
|---|---|---|
| CH 103 | General Chemistry I (no lab) | 3 |
| | Or | |
| CH 104 | General Chemistry I | 4 |
| | Or | |
| CH 155H | Advanced Honors General Chemistry | 5 |

Engineering Science Course (3 hrs.)

| | | |
|---|---|---|
| ES 233 | Engineering Materials | 3 |

Mathematics Course (3 hrs.)

| | | |
|---|---|---|
| MA 393 | Probability & Statistics | 3 |

Required Mechanical Engineering Courses (6 hrs.)

| | | |
|---|---|---|
| MAE 242 | Manufacturing Processes & Equipment | 2 |
| MAE 241 | Manufacturing Processes & Equipment Laboratory | 1 |
| MAE 4193 | Metal Casting | 3 |

Elective Mechanical Engineering Courses (9 hrs.)

| | | |
|---|---|---|
| MAE 383 | Metallurgical Thermodynamics | 3 |
| MAE 393 | Metallurgical Transport Processes | 3 |
| MAE 443 | Engineering Metallurgy | 3 |
| MAE 4143 | Physical Metallurgy | 3 |

# Montessori Education Minor (15 hrs.)

**Franks School of Education**

A minor in Montessori Education provides foundational educational knowledge, skills, and dispositions required in Montessori school settings (ages 6-9). Open to students who are not dual licensure in Elementary Education and Montessori Education EL I majors .

**Requirements**

Requirement (3 hrs.)

| | | |
|---|---|---|
| EDU 1103/EDU 1100 | Montessori E-I EC Overview | 3 |

Choose 12 credits from the following courses (12 hrs.)

| | | |
|---|---|---|
| EDU 111 | Education Exploration | 1 |
| EDU 1001 | Montessori Exploration (EL 1) | 1 |
| EDU 1113/EDU 1110 | Montessori E-I Philosophy/Child Development | 3 |
| EDU 2103/EDU 2100 | Montessori E-I Mathematics Curriculum | 3 |
| EDU 2113/EDU 2110 | Montessori E-I Cultural Geography Curriculum | 3 |
| EDU 3101/EDU 3100 | Montessori E-I Geometry Curriculum I | 1 |
| EDU 3131/EDU 3130 | Montessori E-I Geometry Curriculum II | 1 |
| EDU 3113/EDU 3110 | Montessori E-I Language Curriculum | 3 |

# Music Minor (15-18 hrs.)

**Jannen School of Arts and Sciences - Music Department**

**Requirements**

Core Courses (5-6 hrs.)

| | | |
|---|---|---|
| MUS 213 | Music Theory II | 3 |
| MUS 272 | Music Appreciation | 2 |
| | Or | |
| MUS 323 | Music Literature I | 3 |
| | Or | |
| MUS 123 | Music History I | 3 |
| | Or | |
| MUS 223 | Music History II | 3 |

Please note that MUS 213 has a prerequisite of MUS 113 or permission of Director of Music.

Select Applied Studies (2 hrs.)

| | | |
|---|---|---|
| MUS 1011 | Applied Studies | 1 |

MUS 1011: Woodwind, Brass, Percussion, String, Voice, Piano

Must complete two credit hours

Select Ensemble Studies (2-4 hrs.)

| | | |
|---|---|---|
| MUS 1141 | Chamber Orchestra | 1 |
| MUS 1140 | Chamber Orchestra (no credit) | 0 |
| MUS 1151 | Marching Band | 1 |
| MUS 1150 | Marching Band (no credit) | 0 |
| MUS 1161 | Wind Ensemble/Pep Band | 1 |
| MUS 1160 | Wind Ensemble/Pep Band (no credit) | 0 |
| MUS 1171 | University Choir | 1 |
| MUS 1170 | University Choir (no credit) | 0 |
| MUS 1181 | Jazz Band | 1 |
| MUS 1180 | Jazz Band (no credit) | 0 |

Students must take at least 4 semesters of an ensemble to earn the minor. Ensemble courses are offered for 0 and 1 credit. At least 2 credits must be earned from these course options.

Electives (6 hrs.)

Choose 6 credit hours from the courses listed below.

| | | |
|---|---|---|
| MUS 112 | Piano Lab | 2 |
| MUS 113 | Music Theory I | 3 |
| MUS 123 | Music History I | 3 |
| MUS 223 | Music History II | 3 |
| MUS 253 | Techniques of Conducting | 3 |
| MUS 272 | Music Appreciation | 2 |
| MUS 323 | Music Literature I | 3 |
| MUS 363 | Recording Techniques and Sound Reinforcement | 3 |

# Nutrition Science Minor (20 Hrs.)

**Rinker-Ross School of Health Sciences - Exercise Science Department**

The Nutrition Science Minor is geared toward students who want to develop a strong foundation of nutrition knowledge to support their future career in the healthcare, wellness or athletic field. This minor will provide students with an overview of nutrition science in EXS 273 and more specific performance nutrition knowledge in EXS 323. Students will gain insight into effective health communication, health psychology and behavior change strategies in EXS 383 and PSY 3013 or PSY 363. BIO 384 and CH 104 will allow students to make connections between dietary patterns and the health and function of various human body systems, along with prepare student for graduate-level nutrition programs.

**Requirements**

Required Nutrition Science Courses (20 hrs.)

| | | |
|---|---|---|
| EXS 273 | Nutrition | 3 |
| EXS 323 | Performance Nutrition | 3 |
| EXS 383/AHS 383 | Health Coaching | 3 |
| CH 104 | General Chemistry I | 4 |
| BIO 384 | Human Anatomy & Physiology I | 4 |
| PSY 3013 | Health Psychology | 3 |
| | Or | |
| PSY 363/SOC 363 | Human Behavior & Counseling | 3 |

# Plastics Engineering Minor (25 hrs.)

**Allen School of Engineering and Computing - Design Engineering Technology Department**

Available to all Engineering and Technology students.

**Requirements**

Core Courses (16 hrs.)

| | | |
|---|---|---|
| PET 353 | Thermodynamics & Heat Transfer for Engineering Technology | 3 |
| PET 223 | Polymer Structures, Properties & Applications | 3 |
| PET 224 | Plastics Processing & Testing | 4 |
| PET 323 | Plastics Product Design | 3 |
| PET 333 | Plastics Mold Engineering & Design | 3 |

Electives (9 hrs.)

Choose three courses

| | | |
|---|---|---|
| ETD 313 | Design for Manufacture & Assembly | 3 |
| ETD 433 | Computer Numerical Control Principles | 3 |
| GE 413 | Design of Experiments | 3 |
| GE 313 | SPC & Lean Manufacturing | 3 |
| MGT 413 | Management Of Quality | 3 |

# Political Science Minor (15 hrs.)

**Jannen School of Arts and Sciences - Psychology and Social Sciences Department**

**Requirements**

Core Course (3 hrs.)

| | | |
|---|---|---|
| POLS 113 | Introduction to Government | 3 |

Choose 12 Credits from the following Courses (12 hrs.)

| | | |
|---|---|---|
| POLS 313 | Comparative Governments | 3 |
| POLS 323 | The Contemporary World | 3 |
| | Or | |
| HIS 323 | The Contemporary World | 3 |
| POLS 333 | State & Local Government | 3 |
| POLS 343 | American Political Thought | 3 |
| | Or | |
| HIS 343 | American Political Thought | 3 |
| POLS 363 | United States Foreign Policy | 3 |
| | Or | |
| HIS 363 | United States Foreign Policy | 3 |
| POLS 373 | Political Psychology | 3 |
| | Or | |
| PSY 373 | Political Psychology | 3 |
| POLS 403 | American Constitutional Development | 3 |
| | Or | |
| HIS 403 | American Constitutional Development | 3 |

| | | |
|---|---|---|
| POLS 423 | The United States as a World Power | 3 |
| | Or | |
| HIS 423 | The United States as a World Power | 3 |

# Pre-Law Minor

**Jannen School of Arts and Sciences - Criminal Justice Department**

Students that are interested in attending law school would benefit from completing the Pre-Law Minor to help gain skills and knowledge needed to be successful in law school.

**Requirements**

| | | |
|---|---|---|
| CRJ 263 | Introduction to Criminal Law & Justice | 3 |
| CRJ 273 | Criminal Procedure & Evidence | 3 |
| POLS 403 | American Constitutional Development | 3 |
| LAW 333 | Legal Professions and Preparation | 3 |
| COM 363 | Rhetoric and Persuasion | 3 |
| PHL 313 | Ethics | 3 |
| COM 293 | Argumentation & Debate | 3 |
| | Or | |
| PHL 343 | Logic | 3 |
| ENG 273 | Creative Writing | 3 |
| | Or | |
| ENG 453 | Advanced Composition | 3 |

# Psychology Minor (15 hrs.)

**Jannen School of Arts and Sciences - Psychology and Social Sciences Department**

**Requirements**

Core Course (3 hrs.)

| | | |
|---|---|---|
| PSY 113 | Principles of Psychology | 3 |

Choose 1 from Clinical Core Courses (3 hrs.)

| | | |
|---|---|---|
| PSY 323 | Abnormal Psychology | 3 |
| PSY 363/SOC 363 | Human Behavior & Counseling | 3 |
| PSY 413 | The Psychology of Addiction | 3 |
| PSY 423 | Counseling Theories & Practices | 3 |

Choose 1 from Social Core Courses (3 hrs.)

| | | |
|---|---|---|
| PSY 333 | Psychology of Personality | 3 |
| PSY 343 | Social Psychology | 3 |
| PSY 373 | Political Psychology | 3 |

Choose 1 from Developmental Core Courses (3 hrs.)

| | | |
|---|---|---|
| PSY 223 | Life Span Developmental Psychology | 3 |
| SOC 323 | The Family | 3 |
| PSY 353 | Child & Adolescent Psychology | 3 |

Electives (3 hrs.)

PSY prefix course 200 level or above

## Pure Mathematics Minor (26hrs.)

**Jannen School of Arts and Sciences - Mathematics and Physics Department**

(FOR STUDENTS WITH ANOTHER MAJOR) A grade of "C" or higher is required for each mathematics course in the minor.

**Requirements**

Complete the following courses (20 hrs.)

| | | |
|---|---|---|
| MA 134 | Calculus I | 4 |
| MA 164 | Calculus II | 4 |
| MA 213 | Calculus III | 3 |
| MA 233 | Differential Equations | 3 |
| MA 313 | Introduction to Linear Algebra | 3 |
| MA 343 | Introduction to Proofs | 3 |

Complete one of the following courses (3 hrs.)

| | | |
|---|---|---|
| MA 373 | Abstract Algebra | 3 |
| MA 403 | Real Analysis | 3 |
| MA 413 | Advanced Linear Algebra | 3 |
| MA 453 | Point-Set Topology | 3 |

Complete one of the following courses (3 hrs.)

| | | |
|---|---|---|
| MA 333 | Number Theory | 3 |
| MA 353 | Vector Analysis | 3 |
| MA 373 | Abstract Algebra | 3 |
| MA 403 | Real Analysis | 3 |
| MA 413 | Advanced Linear Algebra | 3 |
| MA 423 | Complex Variables | 3 |
| MA 453 | Point-Set Topology | 3 |

## Robotics Minor (26 hrs.)

**Allen School of Engineering and Computing - Mechanical Engineering Department**

The field of robotics has been constantly growing for the last several decades. With industries struggling to keep costs down by implementing more automation, there is a strong desire to hire students with a background in robotics. The curriculum is designed to prepare students for professional engineering careers that require specialized training in robotics or for graduate studies in robotics. A grade of C or better is required for 200 level and above ECE and MAE courses in the minor.

**Requirements**

Computer Science Course (3 hrs.)

| | | |
|---|---|---|
| CS 1113 | Introduction to Object-Oriented Program | 3 |

Engineering Science Courses (12 hrs.)

| | | |
|---|---|---|
| ES 213 | Statics | 3 |
| ES 223 | Dynamics | 3 |
| ES 243 | Solid Mechanics | 3 |
| ES 253 | Electrical Science | 3 |

| | | |
|---|---|---|
| | Or | |
| ECE 213 | Circuit Analysis | 3 |

Electrical Engineering Courses (8 hrs.)

| | | |
|---|---|---|
| ECE 263 | Digital Systems | 3 |
| ECE 261 | Digital Systems Laboratory | 1 |
| ECE 273 | Microcontrollers | 3 |
| ECE 271 | Microcontrollers Laboratory | 1 |

Mechanical Engineering Course (3 hrs.)

| | | |
|---|---|---|
| MAE 363 | Introduction to Mechatronics | 3 |

## Social Innovation Minor (15 hrs.)

**Ketner School of Business**

**Requirements**

Core Courses (9 hrs.)

| | | |
|---|---|---|
| PHL 213/SI 213 | Theories & Philosophies of Social Innovation | 3 |
| | Or | |
| SI 213/PHL 213 | Theories & Philosophies of Social Innovation | 3 |
| LDR 403 | Creativity, Innovation, and Influence | 3 |
| SI 403 | Social Innovation Practicum | 3 |

Elective (6 hrs.)

Select 6 hours of major-or-career related tactical and/or theoretical courses from the below Course Bank. Other courses can be reviewed and approved in collaboration with student's academic advisor.

## Software Engineering Minor (24 hrs.)

**Allen School of Engineering and Computing - Computer Engineering Department**

**Requirements**

Computer Science Course (18 hrs.)

| | | |
|---|---|---|
| CS 1113 | Introduction to Object-Oriented Program | 3 |
| CS 1123 | C++ & Object Oriented Design | 3 |
| CS 2103 | Algorithm Design & Analysis | 3 |
| SE 353 | Software Engineering | 3 |
| SE 393 | Software Patterns & Team Development | 3 |
| BA 123 | Business Concepts | 3 |

Computer Science/Software Engineering Electives (6 hrs.)

CS/SE Electives above 300/3000 level, or CS 2213

## Spanish Minor (15 hrs.)

**Jannen School of Arts and Sciences - Language and Humanities Department**

Students who plan to enroll in the Spanish Minor must demonstrate a second semester competency in Spanish (SPN 123). Students can enroll in SPN 113 and SPN 123 at Trine. If they seek credit for first year Spanish as a heritage speaker or due to several years of study in high school, students must take either the CLEP exam and pass with a score of 4 or higher or the AP

exam and pass with a 3 or higher. A grade of C or higher in all courses counting toward the minor is required.

**Requirements**

| Core Courses (15 hrs.) | | |
|---|---|---|
| SPN 203 | Spanish III | 3 |
| SPN 213 | Spanish IV | 3 |
| SPN 303 | Spanish Language | 3 |
| SPN 313 | Spanish Writing & Composition | 3 |
| SPN 323 | Spanish Culture | 3 |

## Sport Management Minor (15 hrs.)

**Ketner School of Business**

**Requirements**

| Core Courses (9 hrs.) | | |
|---|---|---|
| SM 313 | Principles of Sport & Recreation Management | 3 |
| BA 123 | Business Concepts | 3 |
| SM 333 | Sports Law and Ethics | 3 |

| Choose 2 courses from the following list (6 hrs.) | | |
|---|---|---|
| EXS 243 | Athletic Training | 3 |
| EXS 263 | Motor Learning | 3 |
| EXS 373/AHS 373 | Health Promotion & Problems | 3 |
| MGT 303 | Risk Management | 3 |
| | Or | |
| EXS 203 | Risk and Sports | 3 |
| MGT 323 | Leadership | 3 |
| MK 203 | Marketing | 3 |
| SM 133 | Contemporary Issues in Sport | 3 |
| SM 393 | Sport Psychology | 3 |

## Sport Psychology Minor (15 hrs.)

**Jannen School of Arts and Sciences - Psychology and Social Sciences Department**

**Requirements**

| Core Courses (15 hrs.) | | |
|---|---|---|
| PSY 113 | Principles of Psychology | 3 |
| EXS 103 | Teaching Sport Skills I | 3 |
| SM 393 | Sport Psychology | 3 |
| EXS 343 | Principles of Human Performance | 3 |
| PSY 413 | The Psychology of Addiction | 3 |

## Structural Engineering Minor (23 hrs.)

**Allen School of Engineering and Computing - Civil Engineering Department**

Structural engineering is traditionally viewed as a branch of civil engineering dealing with the analysis and design of structures to support or resist loads. The curriculum is designed to provide students with (a) a foundation to pursue graduate studies or a

career in structural engineering and (b) an understanding of the theory, behavior, and design of individual structural elements and structural systems. Please contact Reiners Department of Civil and Environmental Engineering if you are interested in this program.

**Requirements**

Engineering Science Courses (3 hrs.)

| | | |
|---|---|---|
| ES 243 | Solid Mechanics | 3 |

Structural Engineering Breadth Courses (14 hrs.)

| | | |
|---|---|---|
| CE 3501 | Structural Analysis Laboratory | 1 |
| CE 3503 | Structural Analysis I | 3 |
| CE 3521 | Structural Design Laboratory | 1 |
| CE 3523 | Structural Design I | 3 |
| CE 4503 | Structural Analysis II | 3 |
| CE 4523 | Structural Design II | 3 |

Structural Engineering Depth Courses (6 hrs.)

(Choose two of the following 3-credit courses)

| | | |
|---|---|---|
| MAE 453 | Mechanical Vibration | 3 |
| CE 4553 | Timber Design | 3 |
| CE 4563 | Bridge Engineering | 3 |
| CE 4713 | Foundation Engineering | 3 |

# Theatre Minor (15 hrs.)

**Jannen School of Arts and Sciences - Language and Humanities Department**

**Requirements**

Core Courses (15 hrs.)

| | | |
|---|---|---|
| THE 103 | Introduction to Theatre | 3 |
| THE 100 | Theatre Production (no credit) | 0 |
| | Or | |
| THE 101 | Theatre Production | 1 |
| ENG 423 | Drama | 3 |
| | Or | |
| ENG 433 | Shakespeare & His Times | 3 |
| COM 373 | Topics In Communication | 3 |

*COM 373 Repeated 3 times with a different theatre emphasis*

# Courses

## AC-Accounting

**AC 203 - Accounting I (3)**

A study of the accounting process and the use of accounting information in business decisions. Topics include the processing of accounting information, income measurement, accrual accounting and accounting for assets, liabilities and equity in the corporate environment. The complete accounting cycle for a service and merchandising business and software applications are included. Prerequisite: MA 113

Prerequisite: MA 113.

**AC 213 - Accounting II (3)**

This course includes the accumulation and use of accounting information by management in planning, control and decision-making. Topics include product costing, budgeting, cost-volume-profit relationships, variable costing and statement of cash flows. Software applications are included. Prerequisite: AC 203

Prerequisite: AC 203.

**AC 303 - Cost Accounting (3)**

Managerial accounting concepts, objectives, techniques, and systems are examined to provide information about financial and non-financial performance measurement. Cost accumulation, allocation, and variance analysis are studied in the context of performance evaluation and responsibility accounting in an organization. Emerging cost concepts and systems are also examined. The course uses computer applications. Prerequisite: AC 213

Prerequisite: AC 213.

**AC 323 - Intermediate Accounting I (3)**

This course introduces accounting theory and practice needed to prepare students for careers in public/corporate/private accounting.

Preparing/reporting relevant information to decision-makers inside and outside the firm is explored in areas such as cash, receivables, inventories, fixed assets, and intangible assets. Revenue recognition and using the time-value of money in accounting are also covered. This course uses computer applications.

Prerequisite: AC 213.

**AC 333 - Intermediate Accounting II (3)**

This is a continuation of Intermediate Accounting I. Together, these classes provide the core of financial reporting knowledge that students will use throughout their professional accounting careers. Areas covered include liabilities, stockholder's equity, leases, accounting changes and error corrections, statement of cash flows, pensions, and income taxes. This course uses computer applications.

Prerequisite: AC 323.

**AC 353 - Tax & Legal Issues for Small Business (3)**

This course covers tax and legal topics pertinent to small businesses, including; forming of a business organization, creating or acquiring a small business, tax planning, benefit and retirement plans, personal asset protection, and estate and succession planning. Prerequisite: AC 213

Prerequisite: AC 213.

**AC 373 - Accounting Information Systems (3)**

This course is designed to provide a working knowledge of accounting information system concepts. The course will emphasize designing and/or evaluating accounting systems in terms of both system controls and meeting internal control objectives. The course uses computer applications. Prerequisites: AC 213, BA 213

Prerequisite: AC 213, BA 213.

**AC 383 - Volunteer Income Tax Assistance (VITA) I (3)**

Students will be trained in tax preparation services and a supporting software program. Students will then prepare federal and state income tax returns for qualifying elderly and low-income individuals. The Volunteer Income Tax Assistance (VITA) program offers free tax help to low-income people, persons with disabilities and limited English speaking taxpayers who need assistance in preparing their own tax returns. Students will gain experience in providing income tax service to clients and in preparing actual returns. Prerequisites: AC 423

Prerequisite: AC 423.

**AC 403 - Advanced Accounting (3)**

This course covers consolidated financial statement preparation for business combinations, translation of foreign currency transactions and financial statements, accounting for reorganizations and liquidations, accounting for partnerships, and introduction to governmental accounting. This course uses computer applications.

Prerequisite: AC 333.

**AC 413 - Governmental Non-For-Profit Accounting (3)**

This course introduces fund accounting and covers the theory and accounting process for governmental and not-for-profit organizations. The accounting for estates and trusts is also included. This course uses computer applications. Prerequisite: AC 333

Prerequisite: AC 333.

**AC 423 - Personal Income Tax (3)**

This course introduces basic concepts of tax law with the emphasis on the underlying concepts common to all entities as they relate to everyday economic life. Special emphasis is placed on taxation of individuals and corporations. Computerized income tax preparation and research are included. Prerequisite: AC 213

Prerequisite: AC 213.

**AC 433 - Corporate Income Tax (3)**

This course includes specialized topics including taxation of partnerships and other conduit entities. Property transactions, specialized topics and tax research are covered. Computerized preparation of tax returns for various entities is included. Prerequisite: AC 423

Prerequisite: AC 423.

**AC 463 - Auditing (3)**

Auditing theory, objectives, and procedures leading to the auditor's opinion on the financial statements are studied. Internal control and its evaluation, auditing standards, and the use of statistical sampling in the audit process are covered in depth. This course uses auditing software applications. Prerequisite: AC 323

Prerequisite: AC 323.

**AC 463 - Auditing (3)**

Auditing theory, objectives, and procedures leading to the auditor's opinion on the financial statements are studied. Internal control and its evaluation, auditing standards, and the use of statistical sampling in the audit process are covered in depth. This course uses auditing software applications. Prerequisite: AC 323

Prerequisite: AC 323.

**AC 473 - CPA Topics (3)**

This course is designed for those accounting majors planning to sit for the CPA exam. It includes the solving of practical accounting problems, advanced topics such as current statements of the Financial Accounting Standards Board, current statements on auditing procedures, and tax topics. This course uses software applications. Prerequisite: AC 333

Prerequisite: AC 333.

**AC 483 - Volunteer Income Tax Assistance (VITA) II (3)**

Students will be trained in tax preparation services and a supporting software program. Students will then prepare federal and state income tax returns for qualifying elderly and low-income individuals. The Volunteer Income Tax Assistance (VITA) program offers free tax help to low-income people, person with disabilities and limited English speaking taxpayers who need assistance in preparing their own tax returns. Students will gain experience in providing income tax service to clients and in preparing actual returns. Students will serve as supervisors of first-year students participating in the program. They will provide training, scheduling, problem resolution and auditing services. Prerequisites: AC 383

Prerequisite: AC 383.

**AC 493 - Selected Topics in Accounting (3)**

This course treats specific or current accounting issues and problems in depth.

**AC 533 - Corporate Taxation (3)**

This course will focus on corporate formations, capital structure issues, dividends, stock redemptions and partial liquidations, complete liquidations, corporate divisions and reorganizations, and S corporation elections. State and local taxation for corporations will also be addressed.

**AC 553 - Federal Taxation of Pass-Through Entities (3)**

The course seeks to develop in participants a broad understanding and ability to assess tax issues associated with partnerships and LLCs. The course will cover partnership formations, partner distributions, sales and liquidations of partnership interests, terminations, issues associated with accounts receivable and inventory and family limited partnerships.

**AC 5003 - Advanced Auditing (3)**

This course provides an in-depth analysis of current auditing issues, including: auditor’s reporting responsibilities, internal control over reporting for public companies, the Sarbanes-Oxley Act and auditing of information technology systems. The course also focuses on compliance concepts and techniques, detailed attestation and review services, and the professional judgment process model for auditing financial statements. The International Auditing Standards (IAS) and the Generally Accepted Government Auditing Standards (GAGAS) are discussed in detail.

**AC 5013 - Managerial Accounting (3)**

This course is an introduction and examination of essential accounting and finance principles, teaching students how to use accounting and financial information for effective decision making, planning, and controlling the operations of business enterprises. Significant emphasis is placed upon determining cost of products and pricing decisions. Other topics include break-even analysis and pricing, capital budgeting, cost-volume-profit analysis and operating budget analysis. Prerequisite: Graduate Standing

Prerequisite: Graduate Standing.

**AC 5023 - Managerial Accounting for MBA (3)**

This course is an introduction and examination of essential managerial accounting principles. Students will use these principles for effective decision making, planning, and controlling. Emphasis is placed upon determining cost of products and pricing decisions. Other topics include break-even analysis and pricing, cost-volume-profit analysis, operating budget analysis, capital budgeting, and variance analysis.

# AHS-Applied Health Sciences

**AHS 113 - Introduction to Public Health (3)**

This course familiarizes students with the field of public health, including the history and current practices through introduction of a variety of disciplines to the basic tenets and applications of public health, including integrating public health with other health professions. Public Health Core Functions, Social Determinant of Health, and Essential Services will be explored, and students will gain an understanding of public health as a broad area of work. The course emphasis is to establish a solid foundation of professional characteristics, behaviors, values, skills, and knowledge for students to build upon in their allied health professions.

**AHS 203 - Medical Law and Ethics for Health Science (3)**

This course introduces legal and ethical issues that impact healthcare professionals. Laws and regulations related to the healthcare industry such as HIPAA, Patient Bill of Rights, and standard of care are addressed. In addition, ethical and moral issues that healthcare professionals may encounter are presented. The student will develop an understanding of the unique interplay of the new and changing healthcare, technology, work force, research, financing, regulation, and personal and professional behaviors, values and assumptions that underlie the current health care system. Prerequisite: BIO 163

Prerequisite: BIO 163.

**AHS 223 - Language Development (3)**

This course will introduce students to linguistic theory with language development. Topics include: development of phonology, morphology, syntax, semantics, pragmatics, and pre-linguistics communication. Multicultural perspectives and bilingualism will also be covered.

**AHS 323 - Speech and Hearing Science (3)**

This course will cover the foundational principles of speech and hearing science. Students will explore basic principles of the physical properties of sound, respiration, speech sound production, and perception of speech sounds. The emphasis will be on typical speech production, auditory perception and measurement of acoustic properties.

**AHS 343 - Anatomy and Physiology of the Speech, Voice and Swallowing Mechanisms (3)**

This course will introduce students to the anatomical and physiological foundations of speech, language, and swallow mechanisms. The main focus is on the neural, respiratory, laryngeal, supra-laryngeal, and aerodigestive subsystems in relation to supporting speech, language, and swallowing.

**AHS 363 - Capstone Experience in Health Sciences I (3)**

The purpose of this class is to prepare seniors in Health Sciences to complete their Capstone Experience successfully. It will introduce them to basic research and statistical concepts that can be used to help them develop and design their own original project and correctly analyze the resulting data. By the completion of the class, students will have designed and selected their basic research program and selected appropriate analysis tools to correctly determine the meaning of the results. Prerequisite: Senior standing or permission of instructor. Cross listed as EXS 363

Prerequisite: Senior standing or permission of instructor. Crosslisted as: EXS 363.

**AHS 373 - Health Promotions & Problems (3)**

A theoretical and practical exploration of the concepts of disease prevention and health promotion. Topics include alcohol, tobacco and drug abuse, physical fitness, nutrition, chronic and communicable diseases, human sexuality and stress management. (Same as EXS 373)

Crosslisted as: EXS 373.

**AHS 383 - Health Coaching (3)**

This class will equip the student with knowledge and an understanding of protocol to give health and wellness counseling to a wide range of clients based on their health history, personal wellness and fitness goals. Prerequisite: EXS 273. (Same as EXS 383)

Prerequisite: EXS 273. Crosslisted as: EXS 383.

**AHS 464 - Audiology and Aural Rehabilitation (4)**

Students will learn approaches to evaluation of hearing through knowledge of hearing anatomy and physiology. Topics include: ear pathology, pure tone audiometry, speech audiometry and acoustic-emittance audiology. Students will also learn the impact hearing impairments have on speech and language development and aural rehabilitation.

**AHS 473 - Global Perspectives Health & Wellness (3)**

The Global Understanding in Health and Wellness course is a study abroad trip intended to assist students in the comparative analysis of holistic health and wellness practices between the U.S. and selected countries. The trip will include site visits to holistic health centers, various cultural tours and key visits to international health and Olympic sport facilities. Students will be expected to complete assigned readings on key health and wellness practices in facilities. Students will be expected to complete assigned readings on key health and wellness practices in the U.S. and other countries to understand the interests and concerns of the global health and wellness community. Prerequisites: sophomore, junior, or senior standing with 2.5 GPA. (Same as EXS 473)

Prerequisite: sophomore, junior, or senior standing with 2.5 GPA. Crosslisted as: EXS 473.

# AI-Artificial Intelligence

**AI 5123 - Foundations of Artificial Intelligence (3)**

This course introduces core principles, theories, and practical applications of Artificial Intelligence (AI). This course prepares students to understand and develop AI technologies. Students will also explore concepts of AI, including machine learning, natural language processing, and computer vision to prepare for advanced research in the field.

**AI 5143 - Natural Language Processing (3)**

This course explores interaction between computers and human language. Students will learn advanced techniques for understanding, generating, and processing natural language. Key topics include sentiment analysis, text classification, and language modeling through a blend of theoretical knowledge and practical applications. This course prepares students to develop and implement Natural Language Processing (NLP) solutions across various domains.

**AI 5163 - AI Ethics & Responsibilities (3)**

This course explores the social, legal, and ethical implications of AI development and deployment. Key topics include bias, fairness, transparency, and privacy. Students will critically examine the responsibilities of AI practitioners and the impact of AI on society, preparing them to navigate and address the ethical challenges in the field.

**AI 5183 - Deep Learning (3)**

This course focuses on neural networks and capability to learn complex patterns and data. Aspects of reinforcement learning, AI project management, deep neural networks, and other advanced architectures are covered. Students will gain a

comprehensive understanding of deep learning techniques and their practical applications.

**AI 5223 - Machine Learning (3)**

This course provides fundamental concepts, techniques, and applications of machine learning models. Students will learn algorithms and techniques for model evaluation to ensure transparency and accountability. Societal implications and ethical considerations in AI development will also be covered.

**AI 5253 - Algorithm Design & Analysis (3)**

This course covers advanced techniques for creating efficient, scalable algorithms and will explore theoretical foundations. Students will solve complex problems in AI and related fields. Key topics include algorithmic complexity, optimization, graph algorithms, and randomized algorithms.

**AI 5273 - AI Capstone Project (3)**

Students address real-world challenges by developing an AI-related project addressing the rapidly evolving field of artificial intelligence (AI). Students will create a project using theoretical foundations, practical applications, and cutting-edge research with ethical considerations in AI development and deployment, ensuring that graduates are equipped to navigate societal implications of AI.

# ARC-Architecture

**ARC 293 - Architecture Appreciation (3)**

An introduction to the built environment, prehistoric to modern, focusing on public/reverential, commercial and residential architecture. Students will be introduced to terminology, some construction techniques, socio-legal implications of high-rise structures, and architectural styles from ancient to postmodern. Structures from around the world will be viewed and discussed.

# ART-Art

**ART 253 - Art Appreciation (3)**

Designed as an introduction to the arts, this course develops aesthetic-critical responses and seeks to enhance the enjoyment of works of art. Painting, sculpture, architecture and other types of art are analyzed in terms of the elements of art, subject, function, medium, organization, style and aesthetic response.

# AS-Air Science-ROTC

**AS 100 - Air Force Leadership Laboratory I (0)**

A dynamic and integrated grouping of leadership developmental activities designed to meet the needs and expectations of prospective Air Force second lieutenants and complement the AFROTC academic program. It is a student planned, organized, and executed practicum conducted under the supervision of the detachment commander and operations flight commander. The focus of LLAB objectives/activities are to promote the Air Force way of life and help effectively recruit and retain qualified cadets. This time is spent acquainting the cadets with basic Air Force knowledge and skills to help them determine whether they wish to continue with the AFROTC program. Corequisite: AS 101

Corequisite: AS 101.

**AS 101 - Heritage and Values of the United States Air Force I (1)**

A survey course designed to introduce students to the United States Air Force and encourage participation in the Air Force Reserve Officer Training Corps. Featured topics include: overview of ROTC, special programs offered through ROTC, mission and organization of the Air Force, brief history of the Air Force, introduction to leadership and leadership related issues, Air

Force Core Values, Air Force officer opportunities, and an introduction to communication studies. Leadership Laboratory is mandatory for AFROTC cadets and complements this course by providing cadets with followership experiences. Corequisite: AS 100

Corequisite: AS 100.

**AS 110 - Air Force Leadership Laboratory II (0)**

A dynamic and integrated grouping of leadership developmental activities designed to meet the needs and expectations of prospective Air Force second lieutenants and complement the AFROTC academic program. It is a student planned, organized, and executed practicum conducted under the supervision of the detachment commander and operations flight commander. The focus of LLAB objectives/activities are to promote the Air Force way of life and help effectively recruit and retain qualified cadets. This time is spent acquainting the cadets with basic Air Force knowledge and skills to help them determine whether they wish to continue with the AFROTC program. Corequisite: AS 111

Corequisite: AS 111.

**AS 111 - Heritage and Values of the United States Air Force II (1)**

A survey course designed to introduce students to the United States Air Force and provides an overview of the basic characteristics, missions, and organization of the Air Force. Corequisite: AS 110

Corequisite: AS 110.

**AS 200 - Air Force Leadership Laboratory III (0)**

A dynamic and integrated grouping of leadership developmental activities designed to meet the needs and expectations of prospective Air Force second lieutenants and complement the AFROTC academic program. It is a student planned, organized, and executed practicum conducted under the supervision of the detachment commander and operations flight commander. The focus of LLAB objectives/activities are to promote the Air Force way of life and help effectively recruit and retain qualified cadets. This time is spent acquainting the cadets with basic Air Force knowledge and skills to help them determine whether they wish to continue with the AFROTC program. As a complement to AS 200 cadets will attend Field Training Preparation (FTP) directly before Leadership Laboratory. The FTP objectives provide training to ensure every cadet is mentally and physically prepared for the rigorous field training environment. Corequisite: AS 201

Corequisite: AS 201.

**AS 201 - Team and Leadership Fundamentals I (1)**

This course focuses on laying the foundation for teams and leadership. The topics include skills that will allow cadets to improve their leadership on a personal level and within a team. The courses will prepare cadets for their field training experience where they will be able to put the concepts learned into practice. The purpose is to instill a leadership mindset and to motivate sophomore students to transition from AFROTC cadet to AFROTC officer candidate. Corequisite: AS 200

Corequisite: AS 200.

**AS 210 - Air Force Leadership Laboratory IV (0)**

A dynamic and integrated grouping of leadership developmental activities designed to meet the needs and expectations of prospective Air Force second lieutenants and complement the AFROTC academic program. It is a student planned, organized, and executed practicum conducted under the supervision of the detachment commander and operations flight commander. The focus of LLAB objectives/activities are to promote the Air Force way of life and help effectively recruit and retain qualified cadets. This time is spent acquainting the cadets with basic Air Force knowledge and skills to help them determine whether they wish to continue with the AFROTC program. As a complement to AS 200 cadets will attend Field Training Preparation (FTP) directly before Leadership Laboratory. The FTP objectives provide training to ensure every cadet is mentally and physically prepared for the rigorous field training environment. Corequisite: AS 211

Corequisite: AS 211.

**AS 211 - Team and Leadership Fundamentals II (1)**

This course focuses on laying the foundation for teams and leadership. The topics include skills that will allow cadets to improve their leadership on a personal level and within a team. The courses will prepare cadets for their field training experience where they will be able to put the concepts learned into practice. The purpose is to instill a leadership mindset and to motivate sophomore students to transition from AFROTC cadet to AFROTC officer candidate. Corequisite: AS 210

Corequisite: AS 210.

**AS 300 - Air Force Leadership Laboratory V (0)**

A dynamic and integrated grouping of leadership developmental activities designed to meet the needs and expectations of prospective Air Force second lieutenants and complement the AFROTC academic program. It is a student planned, organized, and executed practicum conducted under the supervision of the detachment commander and operations flight commander. The focus of LLAB objectives/activities are to promote the Air Force way of life and help effectively recruit and retain qualified cadets. This time is spent acquainting the cadets with basic Air Force knowledge and skills to help them determine whether they wish to continue with the AFROTC program. Corequisite: AS 303

Corequisite: AS 303.

**AS 303 - Leading People and Effective Communication I (3)**

This course teaches cadets advanced skills and knowledge in management and leadership. Special emphasis is placed on enhancing leadership skills and communication. Cadets have an opportunity to try out these leadership and management techniques in a supervised environment as juniors and seniors. Corequisite: AS 300

Corequisite: AS 300.

**AS 310 - Air Force Leadership Laboratory VI (0)**

A dynamic and integrated grouping of leadership developmental activities designed to meet the needs and expectations of prospective Air Force second lieutenants and complement the AFROTC academic program. It is a student planned, organized, and executed practicum conducted under the supervision of the detachment commander and operations flight commander. The focus of LLAB objectives/activities are to promote the Air Force way of life and help effectively recruit and retain qualified cadets. This time is spent acquainting the cadets with basic Air Force knowledge and skills to help them determine whether they wish to continue with the AFROTC program. Corequisite: AS 313

Corequisite: AS 313.

**AS 313 - Leading People and Effective Communication II (3)**

This course teaches cadets advanced skills and knowledge in management and leadership. Special emphasis is placed on enhancing leadership skills and communication. Cadets have an opportunity to try out these leadership and management techniques in a supervised environment as juniors and seniors. Corequisite AS 310

Corequisite: AS 310.

**AS 400 - Air Force Leadership Laboratory VII (0)**

A dynamic and integrated grouping of leadership developmental activities designed to meet the needs and expectations of prospective Air Force second lieutenants and complement thev AFROTC academic program. It is a student planned, organized, and executed practicum conducted under the supervision of the detachment commander and operations flight commander. The focus of LLAB objectives/activities are to promote the Air Force way of life and help effectively recruit and retain qualified cadets. This time is spent acquainting the cadets with basic Air Force knowledge and skills to help them determine whether they wish to continue with the AFROTC program. Corequisite: AS 403

Corequisite: AS 403.

**AS 403 - National Security Affairs/Preparation for Active Duty I (3)**

This course is designed for college seniors and gives them the foundation to understand their role as military officers in American society. It is an overview of the complex social and political issues facing the military profession and requires a measure of sophistication commensurate with the senior college level. The final semester provides information that will prepare cadets for Active Duty. Corequisite: AS 400

Corequisite: AS 400.

**AS 410 - Air Force Leadership Laboratory VIII (0)**

A dynamic and integrated grouping of leadership developmental activities designed to meet the needs and expectations of prospective Air Force second lieutenants and complement thev AFROTC academic program. It is a student planned, organized, and executed practicum conducted under the supervision of the detachment commander and operations flight commander. The focus of LLAB objectives/activities are to promote the Air Force way of life and help effectively recruit and retain qualified cadets. This time is spent acquainting the cadets with basic Air Force knowledge and skills to help them determine whether they wish to continue with the AFROTC program. Corequisite: AS 413

Corequisite: AS 413.

**AS 413 - National Security Affairs/Preparation for Active Duty II (3)**

This course is designed for college seniors and gives them the foundation to understand their role as military officers in American society. It is an overview of the complex social and political issues facing the military profession and requires a measure of sophistication commensurate with the senior college level. The final semester provides information that will prepare cadets for Active Duty. Corequisite: AS 410

Corequisite: AS 410.

# AST-Astronomy

**AST 201 - Astronomy Laboratory (1)**

An introductory laboratory study of basic observational astronomy and the tools of astronomy as students explore the sky. The stars, the planets and the universe of galaxies are observed and measured by observation or computer simulation. Corequisite or Prerequisite: AST 203

Corequisite: AST 203.

**AST 203 - Astronomy (3)**

This course is a study of the formation and life cycles of planets and stars, along with the history of the Milky Way and the cosmos. An emphasis is placed on the solar system and methods of observation and measurement.

# BA-Business Administration

**BA 101 - University Experience for Ketner School of Business (1)**

This course offers resources for success in learning for students new to Trine University. This course will assist students in becoming more efficient learners, understanding self and others, and learning personal life skills. This course will present information about Trine University offices and services to familiarize students with resources and procedures.

Prerequisite: none. Corequisite: none. Crosslisted as: NA.

**BA 102 - University Experience-Business Students (2)**

This course offers resources for success in learning for students new to Trine University. This course will assist students in becoming more efficient learners, understanding self and others, and learning personal life skills. This course will present

information about Trine University offices and services to familiarize students with recourses and procedures. The course will introduce the student to fields of study and careers in business. Students will begin the career planning process.

**BA 113 - Business Computer Applications (3)**

This course emphasizes predominant software packages in word processing, spreadsheets, presentation graphics, database management, and e-mail usage.

**BA 123 - Business Concepts (3)**

A survey course designed to introduce the student to business issues and practices in the United States. All major functions of business are included (management, marketing, law, finance, economics, operations, accounting, information technology) as well as issues facing the business person (ethics, globalization, motivation, etc.) Suitable for students considering a career in business as well as for non-business majors who will interact with the business enterprises (e.g., educators, engineers).

**BA 201 - Professional Development & Strategies (1)**

This is a practical course to assist the student in the development of a professional job search portfolio (i.e. resume, cover letter, follow-up letters). The course includes self-appraisal and career goal setting, job interview techniques, and familiarization with employment resources. Professional strategies are emphasized in the areas of business attire, etiquette and protocol, ethics, human relations, and corporate culture. Prerequisite: Sophomore standing

Prerequisite: Sophomore standing.

**BA 213 - Business Spreadsheets (3)**

This course will teach you to become an advanced Excel user. Concepts include data organization, workbook security, using tables to analyze and report data, integrating and manipulating data from external sources, creating and auditing complex formulas, automation features, advanced data analysis, using charts and graphs to analyze and communicate business information, statistical analysis, and reporting.

Prerequisite: none. Corequisite: none.

**BA 233 - Business Capstone Demonstration (3)**

This capstone course will provide students the opportunity to integrate and synthesize previous coursework in business. In addition, to the Capstone Demonstration Project, students will be required to take the Major Field Test for the associate in business degree program. Prerequisite: All required coursework in the Associate of Business Core

Prerequisite: All required coursework in the Associate of Business Core.

**BA 2001 - Selected Topics in Business (1)**

Offered to treat specific or current business topics in depth.

**BA 2002 - Selected Topics in Business (2)**

Offered to treat specific or current business topics in depth.

**BA 2003 - Selected Topics in Business (3)**

Offered to treat specific or current business topics in depth.

**BA 313 - Insurance (3)**

This course includes the fundamental principles and practices as they relate to life, compensation, fire, marine, and automobile insurance. Prerequisites: LAW 203, MK 203

Prerequisite: LAW 203, MK 203.

**BA 323 - Real Estate (3)**

This course is the study of problems of buying and leasing real property for residence or investment purposes, including the principal commercial and financial transactions involved. Prerequisites: LAW 203, MK 203

Prerequisite: LAW 203, MK 203 .

**BA 333 - Social Media For Business (3)**

Concepts include using digital and social media in a business/industry setting. Concepts include setting up and using wikis, blogs, Facebook, MySpace, Twitter, YouTube, LinkedIn, Ning, Flickr, and other online modalities as a way to increase business, marketing, research, and customer service opportunities. Group work at local businesses will be required. Prerequisite: BA 113

Prerequisite: BA 113.

**BA 343 - International Business (3)**

This course is a study of international business as applied to political, economic, legal and cultural environments. In addition, this course will apply the principles comparative advantages, international trade, world geography, manufacturing and resources both human and natural. Attention will be given to the application of international business management and operations. Prerequisites: BA 123

Prerequisite: BA 123.

**BA 3111 - Business Internship (1)**

The course involves a meaningful work experience related to the student's field of study or other functional areas of business in an approved company. The assignment and company must be approved by the School of Business Internship Coordinator. A maximum of 6 semester credit hours can be counted toward degree requirements, with a maximum of 3 credit hours for any one work session. Prerequisite: BA 123

Prerequisite: BA 123.

**BA 3112 - Business Internship (2)**

The course involves a meaningful work experience related to the student's field of study or other functional areas of business in an approved company. The assignment and company must be approved by the School of Business Internship Coordinator. A maximum of 6 semester credit hours can be counted toward degree requirements, with a maximum of 3 credit hours for any one work session. Prerequisite: BA 123

Prerequisite: BA 123.

**BA 3113 - Business Internship (3)**

The course involves a meaningful work experience related to the student's field of study or other functional areas of business in an approved company. The assignment and company must be approved by the School of Business Internship Coordinator. A maximum of 6 semester credit hours can be counted toward degree requirements, with a maximum of 3 credit hours for any one work session. Prerequisite: BA 123

Prerequisite: BA 123.

**BA 403 - Business & Public Policy (3)**

This course includes an analysis of the legal, political, and economic framework that has shaped public policy toward business in the United States. It will include the methods as to how public policy is created and its implications for management decision making. The issues that this course will be concerned with are: how public policy is related to societal, community, employee, consumer, and environmental concerns and their implication for business. (Same as ECO 453) Corequisite: MGT 363

Corequisite: MGT 363. Crosslisted as: ECO 453.

**BA 423 - Entrepreneurship (3)**

This course focuses on entrepreneurship and small business management. Through case studies, simulations, guest lectures, reading and business plan development, students become aware of the unique challenges facing small business owners and entrepreneur. Students become familiar with the resources available to small business owners, by developing and presenting a business start-up plan. Prerequisite: MGT 353, MGT 363

Prerequisite: MGT 353, MGT 363.

**BA 433 - Business Analytics (3)**

Data accumulation, data filtering and informational dissemination grants organizations a competitive edge in the way they can use simulation or models to make more informed decisions regarding the deployment of capital, market development or resource management. Having an understanding of how data is generated, stored, compiled and manipulated through modeling provides a baseline for individuals and businesses to incrementally defend themselves in the race for societal impact and capital accumulation. This course is designed to help students learn methods to identify and analyze data to better help incorporate data into applicable models to help create informational visualization efficiently in order to generate better educated business decisions.

Prerequisite: BA 213 Business Spreadsheets and MA 253 Statistics. Corequisite: none.

**BA 453 - Global Strategic Management (3)**

This course is a study of key theories and business principles in strategy analysis, formulation and implementation in a domestic and global context. The importance of the external and competitive environment of an industry will be examined. Evaluation methods of an organizations strengths and weaknesses will be emphasized. Integration of principles relating to organizational strategies at the business, corporate and international level. Key global concepts that will be explored are the Diamond of National Advantage along with evaluation of the risks factors for countries. Special emphasis on the management concerns relating to ethical and cultural variations in different countries and regions of the world. Prior knowledge of the functional areas of business will be a foundation for strategy formulation and implementation.

Prerequisite: Senior (last two semesters of school).

**BA 4000 - Independent Research in Business (0)**

Independent research under the direction of an individual instructor can be taken. A research paper is required. Research may be done in any business major. (Course may be taken up to 3 times for credit)

**BA 4001 - Independent Research in Business (1)**

Independent research under the direction of an individual instructor can be taken. A research paper is required. Research may be done in any business major. (Course may be taken up to 3 times for credit)

**BA 4002 - Independent Research in Business (2)**

Independent research under the direction of an individual instructor can be taken. A research paper is required. Research may be done in any business major. (Course may be taken up to 3 times for credit)

**BA 4003 - Independent Research in Business (3)**

Independent research under the direction of an individual instructor can be taken. A research paper is required. Research may be done in any business major. (Course may be taken up to 3 times for credit)

**BA 4100 - Ehinger Fellows Leadership Development (no credit) (0)**

The Ehinger Fellows Leadership Development course is a required component of membership in the Ehinger Fellows leader/mentor/ambassador program. Students will engage in experiential leadership, communication, and strategic planning learning activities, create and implement discipline-specific and university-wide events, and learn how to be effective mentors

and models of the dedication and professionalism expected of successful Trine University students. (Course may be taken up to 4 times for credit.) Prerequisite: Nomination and selection as an Ehinger Fellow

Prerequisite: Nomination and selection as an Ehinger Fellow.

**BA 4101 - Ehinger Fellows Leadership Development (1)**

The Ehinger Fellows Leadership Development course is a required component of membership in the Ehinger Fellows leader/mentor/ambassador program. Students will engage in experiential leadership, communication, and strategic planning learning activities, create and implement discipline-specific and university-wide events, and learn how to be effective mentors and models of the dedication and professionalism expected of successful Trine University students. (Course may be taken up to 4 times for credit.) Prerequisite: Nomination and selection as an Ehinger Fellow

Prerequisite: Nomination and selection as an Ehinger Fellow.

**BA 4200 - Martin Executive in Residence (no credit) (0)**

The Martin Executive in Residence Program supports intellectual stimulation through personal one-on-one professional development to help students succeed, lead and serve within their communities throughout their career. Mentors will offer a high-impact experience by helping students form a professional skill set, including power skills sought after by employers, build extensive professional networks, and establish attainable but ambitious career goals. Students are matched with an experienced professional who has worked or is currently working in their area of study or industry. Students will be challenged to do extensive self-evaluation while also learning to continually build on their strengths. The Martin Executive in Residence Program in the Ketner School of Business will help shape future business leaders by inspiring students to not only achieve academic excellence but to achieve excellence after college. Prerequisite: BA 201 and faculty approval

Prerequisite: BA 201 and faculty approval.

**BA 4201 - Martin Executive in Residence (1)**

The Martin Executive in Residence Program supports intellectual stimulation through personal one-on-one professional development to help students succeed, lead and serve within their communities throughout their career. Mentors will offer a high-impact experience by helping students form a professional skill set, including power skills sought after by employers, build extensive professional networks, and establish attainable but ambitious career goals. Students are matched with an experienced professional who has worked or is currently working in their area of study or industry. Students will be challenged to do extensive self-evaluation while also learning to continually build on their strengths. The Martin Executive in Residence Program in the Ketner School of Business will help shape future business leaders by inspiring students to not only achieve academic excellence but to achieve excellence after college. Prerequisite: BA 201 and faculty approval

Prerequisite: BA 201 and faculty approval.

**BA 5002 - Graduate Independent Study (2)**

This course is to be used when approved by Program Director, in rare circumstances for a student to earn either 1, 2 or 3 credits for an independent study of the subject matter in the program.

**BA 5003 - Graduate Independent Study (3)**

This course is to be used when approved by Program Director, in rare circumstances for a student to earn either 1, 2 or 3 credits for an independent study of the subject matter in the program.

**BA 5103 - Business Ethics (3)**

This course examines business ethics in a systematic and comprehensive way. Topics will include a discussion of why ethics matter, ethics from past to present, ethics as applied to stakeholders, the impact of culture and time on business ethics, ethics in the workplace, ethics as applied to diversity, and the future trends of ethics.

**BA 5223 - Executive Communication (3)**

This course covers the fundamentals of executive business communication in multiple modalities. It will focus on the needs of a business audience (e.g. concision, document design, and the creation and delivery of professional presentation).

**BA 6000Z - Graduate Internship (.5)**

This graduate course is designed to combine classroom theory with practical application through job-related experiences. Students are actively employed in diverse organizations and agencies that relate to their graduate academic training and career objectives. Students will create obtainable SMART goals that apply to their personal and professional goals. Students will build skills related to interviewing etiquette to assist in successful job acquisition. Additionally, students will have the opportunity to reflect on supervisor feedback and their overall experience in the graduate internship.

Prerequisite: None.

**BA 6933 - Statistics & Quantitative Methods (3)**

Throughout this course, students will examine statistical tools and techniques. This course presents an overview of the various primary and secondary research methodologies used in the business world. Students will apply statistical techniques to business strategies. This course will be business oriented providing students with business examples and cases studies.

Prerequisite: Business Administration Concentration content courses.

**BA 6953 - Managing Business Information Systems (3)**

This course examines methodologies to assist in analyzing and designing computer-based information systems for business applications. This courses addresses policy and management issues surrounding information systems in today's enterprises: strategic use, organizational impact, project management, human resource issues and other topics germane to understanding management information systems.

**BA 6963 - Business Administration Capstone (3)**

Students apply knowledge acquired within the Master of Business Administration program by conducting a substantial analysis of business administration problems for a newly minted entrepreneurship. Students use problem solving, design solutions, and identification of best methods through validation testing and implementation. Each student creates their own projects to solve within this course.

Prerequisite: Course must be completed in the student's final term of the MBA program.

# BAN-Business Analytics

**BAN 5003 - Operations Analytics (3)**

This course is an introduction to the principles and techniques of operations analytics. Operations and supply management is defines as the design, operation, and improvement of the systems that create and deliver the organization's primary products and services. In this course, students will learn models and techniques that work with large data sources. This course will demonstrate the application of operations models that are currently being used in industry incorporating big data. Topics considered include process analysis, workforce issues, materials management, quality and productivity, technology, and strategic planning, together with relevant analytical techniques.

**BAN 5003 - Operations Analytics (3)**

This course is an introduction to the principles and techniques of operations analytics. Students will learn models, tools, and techniques that work with large data sources. Application of operations models that are currently being used in industry incorporating big data will be covered. Topics include process analysis, workforce issues, materials management, quality and productivity, technology, and strategic planning, together with relevant analytical techniques.

**BAN 5013 - Analytics Software & Tools (3)**

This course introduces analytics software and provides overview in data analytical tools and techniques. Through practical case studies and illustrations students will extract information from different data types utilizing business analytics, including: advanced spreadsheets, SQL queries, statistical analysis tools, and purpose programming language. Cross list: DIT 7033

Crosslisted as: DIT 7033.

**BAN 5023 - Data Driven Decision-Making (3)**

This course examines the tools and techniques utilized for making business decisions. The emphasis of the course will be on applications and interpretation of the results for making real life business decision, understanding customer behavior, and customizing business tactics to increasingly complex business segments.

**BAN 6093 - Business Analytics Capstone (3)**

This capstone project is the last course of the Master of Science in Business Analytics program in which students provide analytical solutions to a real-world problem sponsored by industry or assigned by an instructor. Students will be guided to complete an individual project aimed at providing a substantive and relevant business analytics solutions to a business problem integrating skills acquired during the program of study in statistical analysis, data management, and modeling. The project requires synthesis of program contents in communication, statistical and operational analysis, analytical software, predictive models, and other applications and techniques. Students are challenged to assess modern data opportunities, formulate a problem definition, and derive multidiscipline business insights from data.

# BIO-Biology

**BIO 103 - General Biology (no Lab) (3)**

An introduction to the basic principles of biology with an emphasis on: biological chemistry, cell biology, metabolism, genetics, diversity of organisms, evolution, and ecology. A background in high school chemistry is strongly recommended. Open to non-science majors only.

**BIO 104 - General Biology (4)**

An introduction to the basic principles of biology with an emphasis on: biological chemistry, cell biology, metabolism, genetics, diversity of organisms, evolution, and ecology. A background in high school chemistry is strongly recommended. Open to non-science majors only. This course cannot be substituted for BIO 114 for either science or engineering majors.

Corequisite: Lab Required.

**BIO 114 - Principles of Biology I (4)**

Five basic topics are discussed in some detail: biological chemistry, cell biology, metabolism, genetics, and animal organization and homeostasis. Laboratory exercises designed to introduce the student to scientific investigation and the structure and function of biological systems are an essential part of the course.

Corequisite: Lab Required.

**BIO 123 - Microbiology for Health Science (3)**

This course prepares students to apply knowledge of microorganisms as they relate to the infection process and disease transmission in the health care setting. This includes the causes of disease and pathological conditions, the body's response mechanisms to diseases and wound healing, and the importance of protective measures.

**BIO 124 - Principles of Biology II (4)**

A continuation of Biology 114, including evolutionary principles, examination of diversity of living things, diversity, structure

and function of plants, animal behavior, populations, communities, ecosystems, the biosphere, and the conservation of each. Prerequisite: "C" or better in BIO 114. Corequisite: Lab Required

Prerequisite: C or better in BIO 114. Corequisite: Lab Required.

**BIO 154 - Human Body Systems (4)**

Human Body Systems will explore the structure and function of the human body. The class and laboratory will cover the different systems that make up the body and how they work to maintain homeostasis. The laboratory will cover the different systems and include model identification and dissection which will facilitate student learning.

Prerequisite: None. Corequisite: Lab Required.

**BIO 163 - Medical Terminology (3)**

This course introduces building and utilizing a medical vocabulary through the use of prefixes, suffixes, word roots, and combining forms/vowels. Emphasis is placed on correct spelling, pronunciation, and knowing the correct definitions of many medical terms.

**BIO 1003 - Plants and People (no lab) (3)**

An introduction to the basic principles of plant biology and the interrelationship between plants and humans with an emphasis on basic plant anatomy and physiology, economic and historical importance, and the roles of plants in the biosphere. Open to non-science majors only.

**BIO 202 - Introduction to Biological Literature & Communication (2)**

A course focusing on the nature and use of biological literature and the communication of scientific knowledge. The student will gain experience in searching the literature, analyzing and summarizing literature, properly citing and referencing sources, and writing a review paper. Oral communication of their work will also be a component of this course. Prerequisite: ENG 133 or ENG 143 or HUM 203 and one Biology course 200-Level or above

Prerequisite: ENG 133 or ENG 143 or HUM 203 and one Biology course 200-Level or above.

**BIO 204 - Fundamentals of Anatomy & Physiology I (4)**

This first course, in a two-course series, develops a comprehensive understanding of the close inter-relationship between anatomy, physiology and pathology as seen in the human organism. Introduces students to the cell, which is the basic structural and functional unit of all organisms, and covers tissues, integument, skeleton, muscular and nervous systems as an integrated unit.

**BIO 212 - Pharmacology for Surgical Technologist (2)**

This course examines the various types of drugs and familiarizes the student with the forms by which medications are administered, utilization of proper injection techniques, and preparation of parental and oral medications. The student is instructed in the proper use of the Physician's Desk Reference (PDR) and will work with it in classroom assignments.

**BIO 222 - Field Ecology (2)**

Travel course to observe native habitats and communities and how they are impacted by human activities. The course will incorporate cultural and historical context pertinent to the system of interest. Students will learn how to design field experiments, to do hypothesis testing, collect & analyze data, and interpret results. May include kayaking, canoeing, hiking, camping, boating, and/or snorkeling. Prerequisite: BIO 124

Prerequisite: BIO 124.

**BIO 224 - Fundamentals of Anatomy & Physiology II (4)**

This second part, of a two-course series**,** develops a comprehensive understanding of the close inter-relationship between anatomy, physiology and pathology as seen in the human organism and covers cardiovascular, digestive, urinary and

reproductive systems as an integrated unit. Prerequisite: BIO 204

Prerequisite: BIO 204.

**BIO 233 - Cell Biology (3)**

Understanding of cell biology has grown rapidly over the past two decades along with the development of genetics, biochemistry, and molecular biology. This course will introduce students to this unifying discipline which explores organization and function of the cell including structure of cellular organelles, membrane transport, cellular communication, flow of genetic material, and cell division. Prerequisite: A 'C' or better in BIO 114 or ES 141

Prerequisite: A 'C' or better in BIO 114 or ES 141.

**BIO 253 - Fundamentals of Genetics (3)**

This course will cover the basic principles of genetics including how genetic material replicates and is passed on, how it contains information that results in a phenotype and how it can change. Major concepts to be covered include the Mendelian laws of inheritance, factors that contribute to the modification of Mendelian patterns, genetic variation, linkage and meiotic mapping, sex determination, DNA structure and replication, transcription, translation, mutations, genome organization, and basic regulatory mechanisms in prokaryotic and eukaryotic gene expression.

Prerequisite: BIO 114.

**BIO 273 - Analysis of Biological Data (3)**

This course will cover basic experimental design and analysis of data for biology majors. Data description and display, identifying an experimental design appropriate to test stated hypothesis, and learning the appropriate univariate statistic to analyze the collected data will be emphasized. Experiments and data types specific to the disciplines of biology and health sciences will be presented.

**BIO 274 - General Ecology (4)**

A study of the interactions of organisms and environments, this course focuses on individuals, populations, and communities. Investigations focus on techniques to gauge interactions between the biological and physical environments, field and conceptual sampling methods, statistical analysis, and population models.

Prerequisite: BIO 124 Principles of Biology II. Corequisite: Laboratory Required.

**BIO 302 - Professional Practice in Science (2)**

This course will provide students with the professional tools necessary to be successful in the fields of biology, chemistry, biochemistry, and forensic science. In this course, students will construct an application packet, research relevant literature, orally present information in a professional setting, and provide peers with constructive feedback. (Same as CH 302). Prerequisite: BIO 202; Junior Standing or Permission of the Chair

Prerequisite: BIO 202, Junior Standing or Permission of the Chair.

**BIO 304 - Plant Biology (4)**

The structure and function of the major plant phyla are studied. Methods of classification are illustrated. The physiology and evolutionary relationships are explained. Prerequisite: BIO 124

Prerequisite: BIO 124. Corequisite: Lab Required.

**BIO 312 - Fundamentals of Immunology (2)**

An introduction to immunology including the innate and adaptive immune systems. More emphasis will be on the adaptive immune system. Several key concepts will be linked to important topics such as the treatment and prevention of disease, transplantation of organs, and what happens when the immune systems breaks down. Prerequisites: CH 204 and BIO 324 (same as CH 312)

Prerequisite: CH 204 and BIO 324. Crosslisted as: CH 312.

**BIO 314 - Animal Biology (4)**

The structure and function of the major animal phyla are studied. Methods of classification are illustrated. The behavioral, physiological, and evolutionary relationships are explained. Prerequisite: BIO 114 or ES 141

Prerequisite: BIO 114 or ES 141. Corequisite: Lab Required.

**BIO 324 - Microbiology (4)**

The isolation, growth, structure, function, heredity, and identification of microorganisms with emphasis on their relationship to humans. Prerequisites: BIO 114 OR ES 141

Prerequisite: BIO 114 or ES 141. Corequisite: Lab Required.

**BIO 334 - Environmental Biology (4)**

A study of the impacts and interactions of human society and the environment including ethics, risk management, economics, policy making, population growth, energy, pollution, land use planning, soils, agriculture, and water, and their consequences. Labs include field trips to assess environmental conditions and hazards, public perception, and human impacts to the environment. Prerequisite: BIO 124

Prerequisite: BIO 124. Corequisite: Lab Required.

**BIO 342 - Metals in Biology (2)**

This course will introduce students to important biochemistry and inorganic chemistry concepts, such as preferred ligands and binding geometry for different metal ions, and then cover more in-depth topics on the importance of metal ions in life. These topics will include protein structure, small-molecule transport, catalysis, and metal ion uptake, transport, and storage. A survey of the toxicity of metal ions and how their medicinal uses (such as chemotherapy) will also be presented. Prerequisite: CH 204; Crosslisted with CH 342

Prerequisite: CH 204 Organic Chemistry I and Laboratory.

**BIO 344 - Systems Ecology (4)**

A study of the interactions of organisms and environments, the course focuses on terrestrial and aquatic systems, ecosystems, landscapes, and cycling of matter and energy within systems. Investigations focus on techniques to quantify the movement of matter and energy through a system, field and conceptual sampling methods, statistical analysis, energy budget modeling, and an exploration of emerging technologies in ecology. Prerequisite: BIO 274

Prerequisite: BIO 274 General Ecology. Corequisite: Laboratory required.

**BIO 364 - Toxicology (4)**

The methods and design of both acute and chronic toxicity tests will be surveyed. Probits of percent mortality versus log dose and other appropriate statistical methods of toxin analysis are applied to laboratory data. Emphasis will be given to mechanisms of action and metabolic detoxification and elimination. Federal regulations involving manufacture use categories and proper disposal are reviewed. (SAME AS CH 364) Prerequisites: BIO 114 or ES 141; CH 204. Recommended: BIO/CH 434

Prerequisite: Required: BIO 114 or ES 141; CH 204 Recommended: BIO/CH 434. Corequisite: Lab Required. Crosslisted as: CH 364.

**BIO 374 - Forensic Biology (4)**

This course will introduce students to basic scientific principles and their application in professional practice of Forensic Biology. The lecture and laboratory portions will provide students with a scientific grounding to understand the application of the science of biology to legal investigations. Students will learn the principles and analytical methods over a variety of fields such as pathology, entomology, animal biology, anatomy and physiology, microbiology, serology, and molecular biology as

they apply to forensic biology. Laboratory safety, quality assurance, and quality control are also discussed. Prerequisite: BIO 414

Prerequisite: BIO 414. Corequisite: Lab Required.

**BIO 383 - Introduction to Pharmacology (3)**

This introduction to pharmacology will focus on the study of drugs. This course will explain various therapeutic and adverse effects associated with medications. It will cover several body systems and conditions affecting them, as well as the pharmacological treatment of them. Topics will include, muscle relaxants, anesthetics, and pain medication. This course is to help individuals gain knowledge of how various medications affect the body. Prerequisite: CH 114 or CH 155H; BIO 394

Prerequisite: CH 114 or CH 155H; BIO 394.

**BIO 384 - Human Anatomy & Physiology I (4)**

Develops a comprehensive understanding of the close inter-relationship between anatomy and physiology as seen in the human organism. Introduces students to the cell, which is the basic structural and functional unit of all organisms, and covers tissues, integument, skeleton, muscular and nervous systems as an integrated unit. Prerequisite: BIO 114 or ES 141; CH 104

Prerequisite: BIO 114 or ES 141; CH 104. Corequisite: Lab Required.

**BIO 392 - Aquatic Biology (2)**

An introduction to organisms and processes in the aquatic environments, including function, biodiversity, and ecology of organisms. Topics include: the chemical and physical environment; the ecology of pelagic and benthic organisms, including those from lentic and lotic systems, benthic plants and phytoplankton; zooplankton; invertebrates, fishes; productivity and fisheries; freshwater pollution and conservation. The course will also include application of identification, sampling and analytical techniques to aquatic organisms and their habitats of local lakes and streams, and several required field trips. Prerequisite: BIO 274

Prerequisite: BIO 274.

**BIO 394 - Human Anatomy & Physiology II (4)**

Develops a comprehensive understanding of the close inter-relationship between anatomy and physiology as seen in the human organism. Continues the study of the inter-relationships of the systems of the human body. Introduces students to the study of the endocrine, cardiovascular, lymphatic, respiratory, digestive, urinary and reproductive systems. Prerequisite: BIO 384

Prerequisite: BIO 384. Corequisite: Lab Required.

**BIO 404 - Embryology (4)**

Study of structural, physiological, and molecular levels of development processes. A descriptive and experimental analysis of developing systems with emphasis on ordates. Prerequisite: BIO 394

Prerequisite: BIO 394. Corequisite: Lab Required.

**BIO 413 - Entomology (3)**

Integrated studies of the principal morphological, physiological, ecological and systematic relationships of insects.

Prerequisite: BIO 114.

**BIO 414 - Genetics (4)**

This course provides the principles of classical and molecular genetics. Topics include Mendelian inheritance, chromosome function, linkage and recombination mapping, cellular processing of biological information, new genetic tools, evolutionary genetics, and genomics. Quality assurance is also discussed. The course will mainly consist of lectures, chromosome level experiments, and problem sets that students will solve and return. Prerequisite: BIO 114 or ES 141; CH 204; BIO 233

Recommended

Prerequisite: BIO 114 or ES 141; CH 204; BIO 233 Recommended. Corequisite: Lab Required.

**BIO 424 - Conservation (4)**

A study of biodiversity, including the negative impact of human society and what can be done to preserve it. Topics include measurement of biodiversity, ecosystem function, extinction, habitat destruction, fragmentation, degradation, over-exploitation, invasive species, climate change, conservation planning and priorities, fire, human interaction with the environment, human-modified landscapes and experimental design. Meets Ecology requirement for Biology majors. The lab focuses on communities and small populations by using GIS, GPS, computer modeling and the design, management and restoration practices of natural areas. Includes a variety of field trips to natural areas and implementation of hands-on management and restoration practices, including seed collection and processing, wildlife management and controlled burning. Prerequisite: BIO 274

Prerequisite: BIO 274. Corequisite: Lab Required.

**BIO 434 - Biochemistry I (4)**

The chemical and physical behavior of biologically important compounds such as carbohydrates, lipids, proteins, nucleic acids, and enzymes are discussed. The various metabolic pathways are discussed in light of their organic mechanisms. (Same as CH 434) Prerequisites: BIO 114 or ES 141; CH 204

Prerequisite: BIO 114 or ES 141; CH 204. Corequisite: Lab Required. Crosslisted as: CH 434.

**BIO 443 - Pathology (3)**

The course is an introduction to pathology, which is the study of disease. An overview of a variety of diseases will be discussed including cardiovascular disease, asthma, infection, cancer, epilepsy, multiple sclerosis, rheumatoid arthritis, Crohn's disease, anemia, leukemia, and Alzheimer's dementia. Prerequisites: BIO 384

Prerequisite: BIO 384 Anatomy and Physiology I.

**BIO 444 - Biochemistry II (4)**

A second semester in Biochemistry would include topics in biosynthesis of the following: amino acids; purines and pyrimidines; proteins; nucleic acids. Topics in nitrogen metabolism and control of protein synthesis would also be discussed. Laboratories would supplement the lecture material. Prerequisites: BIO 434 or CH 434 (Same as CH 444)

Prerequisite: BIO 434 or CH 434. Corequisite: Lab Required. Crosslisted as: CH 444.

**BIO 454 - Molecular Biology (4)**

This course is designed to provide a comprehensive overview of the key concepts in molecular biology and their applications. It will cover structure and function of nucleic acids, chromosome structure, and regulation of gene expression, as well as biological techniques used in the area of molecular biology. Additional topics will include advances in genetic engineering, gene therapy, protein functions, and programmed cell death. Prerequisites: BIO 414 or Permission of Instructor

Prerequisite: BIO 414 or Permission of Instructor. Corequisite: Lab Required.

**BIO 482 - Biostatistics (2)**

Advanced experimental design and analysis for biology and chemistry majors. Data description and display, identifying an experimental design appropriate to test hypothesizes, and learning the appropriate univariate statistic to analyze the collected data will be emphasized. Experiments and data types specific to the disciplines of chemistry, biology and health sciences will be presented. Prerequisite: MA 253

Prerequisite: MA 253.

**BIO 4001 - Special Assignments in Biological Sciences (1)**

Directed reading, independent study, or research, supervised laboratory of field work. The number of credit hours will be determined by the scope of the assignment. Prerequisite: Permission of Department Chair

Prerequisite: Permission of Department Chair.

**BIO 4002 - Special Assignments in Biological Sciences (2)**

Directed reading, independent study, or research, supervised laboratory of field work. The number of credit hours will be determined by the scope of the assignment. Prerequisite: Permission of Department Chair

Prerequisite: Permission of Department Chair.

**BIO 4003 - Special Assignments in Biological Sciences (3)**

Directed reading, independent study, or research, supervised laboratory of field work. The number of credit hours will be determined by the scope of the assignment. Prerequisite: Permission of Department Chair

Prerequisite: Permission of Department Chair.

**BIO 4004 - Special Assignments in Biological Sciences (4)**

Directed reading, independent study, or research, supervised laboratory of field work. The number of credit hours will be determined by the scope of the assignment. Prerequisite: Permission of Department Chair

Prerequisite: Permission of Department Chair.

# BME-Biomedical Engineering

**BME 2011 - Intro to BME Programming MATLAB (1)**

An introduction to numerical methods for solving engineering problems. Introduction to programming in MATLAB.

Prerequisite: None. Corequisite: None.

**BME 2012 - Intro to Biomedical Engineering (2)**

An introduction to various topics of biomedical engineering. Lecture focuses on the interrelationship between mathematics, natural sciences, and fundamental biomedical engineering principles. Co-requisite: CH 104 or CH 155H, MA 134

Corequisite: CH 104 or CH 155H, MA 134.

**BME 2013 - Introduction to Biomedical Engineering (3)**

An introduction to various topics of biomedical engineering. Lecture focuses on the interrelationship between mathematics, natural sciences, and fundamental biomedical engineering principles. Corequisite: CH 104 or CH 155H, and MA 134

Corequisite: CH 104 or CH 155H, and MA 134.

**BME 2401 - BME Design and Manufacturing Lab (1)**

Demonstrations of metal casting (sand casting, lost foam casting, investment casting), additive manufacturing, material removal processes (turning, milling, drilling, grinding), deformation processes, and welding processes. Application of these processes for the design and manufacturing of a relevant biomedical technology. Corequisite: BME 2402

Corequisite: BME 2402.

**BME 2402 - BME Design and Manufacturing (2)**

An examination of engineering materials and manufacturing processes for designing, developing, and manufacturing

biomedical technologies. Corequisite: BME 2401

Corequisite: BME 2401.

**BME 3003 - Musculoskeletal Biomechanics (3)**

This course provides an introduction to fundamental approaches used to analyze human movement from a mechanical perspective, including forward and inverse dynamics, and also examines the properties of various musculoskeletal tissues (e.g. muscle, bone, cartilage). Students study the basic principles of two- and three-dimensional, absolute and relative, kinematics, kinetics of rigid bodies in planar motion, electromyography, and musculoskeletal structure and function. Students also apply these concepts to quantitative movement analysis, with an emphasis on the mechanics of typical and pathologic gait. This course relies on a blend of traditional instruction and experiential learning techniques. Prerequisites: MA 164 and PH 224 and "C" or better in BME 2011 and "C" or better in BME 2012 and "C" or better in ES 213

Prerequisite: MA 164 and PH 224 and "C" or better in BME 2011 and "C" or better in BME 2012 and "C" or better in ES 213. Corequisite: None.

**BME 3103 - Biomaterials (3)**

The study of both biological materials and synthetic materials (metals, ceramics and polymers) for medical applications. Topics include structural and physical properties; degradation; processing; bulk and surface properties; interaction between biological tissues and biomaterials; biocompatibility; ASTM Standards, and FDA. Prerequisites: ES 233 and "C" or better in BME 2011 and "C" or better BME 2012

Prerequisite: ES 233 and "C" or better in BME 2011 and "C" or better BME 2012. Corequisite: None.

**BME 3202 - Biomedical Engineering Laboratory Techniques (2)**

Introduction to basic laboratory techniques used in the development of human diagnostics and therapeutics. Prerequisites: CH 104 or CH 155H and ES 141 or BIO 114; Corequisite: BME 2013

Prerequisite: CH 104 or CH 155H and ES 141 or BIO 114. Corequisite: BME 2013.

**BME 3203 - Biomedical Engineering Laboratory Techniques (3)**

Introduction to basic laboratory techniques used in the development of human diagnostics and therapeutics. Corequisites: BME 2011 and BME 2012

Corequisite: BME 2011 and BME 2012.

**BME 3212 - Biomedical Engineering Research Techniques (2)**

Integration of laboratory techniques and research processes as related to the biomedical engineering field. Prerequisites: BME 2401, BME 2402, BME 3203; Corequisite: BME 3223

Prerequisite: BME 2401, BME 2402, BME 3203. Corequisite: BME 3223.

**BME 3223 - Biostatistics and Probability (3)**

Basic principles and methods of statistics and probability with biomedical applications for data analysis using statistics software. Fundamentals in basic statistics and probability include hypothesis testing, sampling, distributions, regression and correlation analysis, analysis of variance, data analysis, and experimental design. Prerequisite: MA 213

Prerequisite: MA 213. Corequisite: None.

**BME 4003 - Advanced Topics in Biomechanics (3)**

A survey of advanced topics in biomechanics. Topics covered will include orthopedic biomechanics, soft tissue mechanics, injury mechanisms and rehabilitation. Prerequisites: BME 3003

Prerequisite: BME 3003.

**BME 4103 - BME Quality & Regulatory Compliance (3)**

In today's dynamic healthcare landscape, the development and production of medical devices are subject to rigorous regulatory frameworks. This course explores the intricate world of quality management and regulatory compliance within the biomedical engineering field. Students will gain foundational knowledge and insights into the essential federal laws and regulations that govern every facet of medical device lifecycle – from inception to market deployment.

Prerequisite: Junior Standing or Department Chair Permission.

**BME 4213 - Introduction to BioMEMS (3)**

This course introduces students to the multidisciplinary field of Biomedical Micro-Electro-Mechanical Systems (BioMEMS), as applied to medicine and biology. It teaches the underlying physical and transport phenomena at the microscale, methods of microfabrication (including soft lithography, laser writing, micropatterning, wax printing, and 3D printing), and substrate materials for developing biomedical microdevices. The course will also highlight the application of BioMEMS in areas including, but not limited to, medical diagnostics, cell and tissue engineering, and cancer biology.

Corequisite: BME 4603.

**BME 4223 - Biomedical Applications of VR Design (3)**

Students will learn how to create virtual reality experiences with a biomedical focus. Students will be introduced to making and loading worlds, user interfaces, accepting user input, and building other user experiences. In addition, students will explore the iterative design process and how to improve a VR application based on user feedback.

Prerequisite: BME 2011 or MAE 112 and Junior Standing.

**BME 4303 - Biochemical Engineering (3)**

Microbiological and biochemical phenomena are treated from an engineering standpoint. Course topics include an overview of basic biological concepts along with the modern techniques of biotechnology. Mathematical models of enzyme and whole cell systems are derived and discussed. Commercial and laboratory reactors, as well as separation techniques, are studied. Prerequisite: MA 233 (BME 4303 same as CHE 4073)

Prerequisite: MA 233. Crosslisted as: CHE 4073.

**BME 4403 - Biomedical Engineering Measurements & Instrumentation I (3)**

Principles of design and analysis of electronic instrumentation for medical applications. Topics include frequency domain analysis, various electrodes and transducers for physiological measurement, and biopotential amplifiers. Prerequisite: PH 234 and ECE 213

Prerequisite: PH 234 and ECE 213. Corequisite: Lab Required.

**BME 4413 - Biomedical Engineering Measurements & Instrumentation II (3)**

Continuation of principles of design and analysis of electronic instrumentation and measurement for medical applications. Topics include modalities for physiological measurement, biological signal acquisition and processing, medical imaging modalities and electrical safety. Prerequisite: BME 4403

Prerequisite: BME 4403. Corequisite: Lab Required.

**BME 4503 - Tissue Engineering (3)**

Study of cell-cell and cell-matrix interactions in the context of the function of normal and pathological tissues. Applications may include cell trafficking, cellular delivery of drugs, and regeneration of tissues. Prerequisites: BME 3212 or CHE 4073

Prerequisite: BME 3212 or CHE 4073. Corequisite: None.

**BME 4603 - Bio Fluid Mechanics (3)**

Fundamentals of fluid mechanics as it relates to anatomy and physiology of the human body. Properties, characteristics, parameters, and governing equations of fluid flow in laminar and turbulent regimes. Detailed understanding of relationships involving the physiological modeling of biological flow. Prerequisites: BME 3103, MA 233 and BIO 384

Prerequisite: BME 3103, MA 233 and BIO 384.

**BME 4613 - Biological Mass & Energy Transport (3)**

Fundamentals of heat and mass transport. Concepts of conduction, convection, thermal properties of materials, mass diffusion and compartmental modeling. Principles applied to physiological systems. Prerequisites: BME 4603 and ES 313

Prerequisite: BME 4603 and ES 313.

**BME 4853 - Biomedical Engineering Design I (3)**

Introduction to design methodology and practice. Product specifications. Concept generation and selection. Product design. Design for manufacturing. Economics of product development. Prototyping. Introduction to topics of product regulations. Teams of students work on a design project in the area of biomechanical engineering. Design project work will continue in BME 4863. Prerequisites: BME 3212 and "C" or better in BME 4403 and "C" or better in BME 4603

Prerequisite: BME 3212 and "C" or better in BME 4403 and "C" or better in BME 4603. Corequisite: None.

**BME 4863 - Biomedical Engineering Design II (3)**

Conclusion of biomechanical engineering design project. Preparation of a formal written design report and oral presentation of the design. Course must be taken the semester immediately following BME 4853. Prerequisites: BME 4853 and BME 3223

Prerequisite: BME 4853 and BME 3223. Corequisite: None.

**BME 4901 - Special Topics in Biomedical Engineering (1)**

An elective course for biomedical engineering students to study special topics of interest. Prerequisites: Permission from the Department Chair

Prerequisite: Permission from Department Chair.

**BME 4902 - Special Topics in Biomedical Engineering (2)**

An elective course for biomedical engineering students to study special topics of interest. Prerequisites: Permission from the Department Chair

Prerequisite: Permission from Department Chair.

**BME 4903 - Special Topics in Biomedical Engineering (3)**

An elective course for biomedical engineering students to study special topics of interest. Prerequisites: Permission from the Department Chair

Prerequisite: Permission from Department Chair.

**BME 4904 - Special Topics in Biomedical Engineering (4)**

An elective course for biomedical engineering students to study special topics of interest. Prerequisites: Permission from the Department Chair

Prerequisite: Permission from Department Chair.

# CE-Civil Engineering

**CE 1021 - Computer Tools for Civil Engineering (1)**

This course is required for all freshmen civil engineering students. Its purpose is to introduce students to computer software that can assist them in engineering problem solving. Basic programming skills will also be introduced, allowing students to customize software to meet the unique needs of specific civil engineering problems. A wide variety of problem solving approaches will be highlighted throughout the class, including iteration, optimization, and database manipulation.

**CE 1023 - Engineering Math (3)**

This course provides an overview of important mathematical concepts required for the civil engineering coursework and introduces computer software to solve engineering problems. Topics include algebra, trigonometry, differentiation, integration, computer software for calculations and graphing, and basic programming techniques.

**CE 2001 - Geomatics Laboratory (1)**

The lab sessions equip students with practical skills utilizing geomatics techniques and technologies. Working with surveying equipment, Global Navigation Satellite System (GNSS), and remote sensing data, students will apply their lecture knowledge to real-world projects and gain valuable hands-on experience. Group projects will foster collaboration and reinforce understanding. Corequisite: CE 2003

Corequisite: CE 2003.

**CE 2001 - Basic Surveying Laboratory (1)**

The lab sessions equip students with practical skills utilizing geomatics techniques and technologies. Working with surveying equipment, Global Navigation Satellite System (GNSS), and remote sensing data, students will apply their lecture knowledge to real-world projects and gain valuable hands-on experience. Group projects will foster collaboration and reinforce understanding. Corequisite: CE 2003

Corequisite: CE 2003.

**CE 2003 - Introduction to Geomatics (3)**

This course provides a comprehensive overview of geomatics, the science of collecting, analyzing, and managing geographic information. Topics covered in the course include principles of surveying, and mapping, as well as the use of the Global Navigation Satellite System (GNSS) and remote sensing technologies to collect and analyze data. Corequisite: MA 134, CE 2001

Corequisite: MA 134, CE 2001.

**CE 2003 - Geomatics (3)**

This course provides a comprehensive overview of geomatics, the science of collecting, analyzing, and managing geographic information. Topics covered in the course include principles of surveying, and mapping, as well as the use of the Global Navigation Satellite System (GNSS) and remote sensing technologies to collect and analyze data. Corequisite: MA 134, CE 2001

Corequisite: MA 134, CE 2001.

**CE 3101 - Environmental Engineering Lab (1)**

Students will investigate environmental problems through projects, demonstrations, and laboratory investigations. As a writing in the discipline course, students will also develop data presentation and analysis skills, within the larger context of memo and report writing. Corequisite: CE 3103

Corequisite: CE 3103.

**CE 3103 - Environmental Engineering (3)**

Environmental issues associated with air pollution, water quality, water treatment, wastewater treatment, solid & hazardous waste, and radioactive waste will be discussed and evaluated. Impacts to groundwater and surface water resources will also be examined. Regulations pertaining to each pollution scenario will be stressed, along with mass balances, environmental chemistry, and biological principles needed to accurately discuss environmental impacts. Prerequisite: CH 114; Corequisite: CE 3101

Prerequisite: CH 114. Corequisite: CE 3101.

**CE 3201 - Civil Engineering Materials Laboratory (1)**

Students test and evaluate the physical and mechanical properties of engineering materials such as steel, portland cement, concrete, asphalt, and timber. Corequisite: CE 3203

Corequisite: CE 3203.

**CE 3203 - Civil Engineering Materials (3)**

This course is an introduction to materials used in Civil Engineering such as aggregate, asphalt, concrete, steel, and timber. The course discusses the origin, manufacture, mechanical properties, and grading of each material. Corequisite: CE 3201, ES 243

Corequisite: CE 3201, ES 243.

**CE 3301 - Hydraulic Engineering Lab (1)**

Hydraulic principles in pressurized and free-surface flow systems are tested and evaluated. Corequisite: CE 3303

Corequisite: CE 3303.

**CE 3303 - Hydraulic Engineering (3)**

This course is an introductory course in hydraulic engineering and design. Building on the fundamental principles of fluid mechanics, this course focuses on how these principles are applied to the design of water distribution networks and stormwater, sanitary sewer, and combined sewer systems. These systems include components such as pipes, pumps, storage facilities, detention basins, open channels, valves, and weirs. Prerequisite: Grade of "C" or better in ES 323; Corequisite: CE 3301

Prerequisite: Grade of "C" or better in ES 323. Corequisite: CE 3301.

**CE 3501 - Structural Analysis Laboratory (1)**

Computer methods for structural analysis are introduced, including both commercial software packages and common applications such as spreadsheets. Experiments are conducted to measure the vertical deflection of beams and compare results to deflections predicted by classical methods. Prerequisite: Grade of "C" or better in ES 243; Corequisite: CE 3503

Prerequisite: Grade of "C" or better in ES 243. Corequisite: CE 3503.

**CE 3503 - Structural Analysis I (3)**

The ASCE 7 model code is introduced to determine structural loadings including dead, live, snow, and wind loads and their combinations that are used in structural design. Structures are classified as stable or unstable and as statically determinate or indeterminate. Load effects, tributary loads, and load paths are determined for floor and roof framing plans. Statically determinate and indeterminate beams, trusses, and frames are analyzed by classical methods. Prerequisite: Grade of "C" or better in ES 243; Corequisite: CE 3501

Prerequisite: Grade of "C" or better in ES 243. Corequisite: CE 3501.

**CE 3521 - Structural Design Laboratory (1)**

This course introduces the analysis and design of reinforced concrete and structural steel members subjected to tension,

compression, and flexural loads. Reading, interpreting, and applying codes and specifications is emphasized. Prerequisite: CE 3503; Corequisite: CE 3523

Prerequisite: CE 3503. Corequisite: CE 3523.

**CE 3523 - Structural Design I (3)**

This course introduces the analysis and design of reinforced concrete and structural steel members subjected to tension, compression, and flexural loads. Reading, interpreting, and applying codes and specifications is emphasized. Prerequisite: CE 3503; Corequisite: CE 3521

Prerequisite: CE 3503. Corequisite: CE 3521.

**CE 3603 - Transportation Engineering (3)**

This course provides a fundamental overview of roadway transportation, covering its design, operation, control, and planning. It covers traffic operations, user behavior, capacity assessment, geometric design, traffic signal timing, and transportation planning, as well as fundamental concepts in air, rail, and freight engineering.

**CE 3701 - Soil Mechanics Laboratory (1)**

Students perform laboratory tests that are common in a geotechnical engineering lab. Tests include classification, permeability, compaction, consolidation, and shear strength tests. Additionally, students perform in-situ sampling, dynamic cone penetrometer testing, and visually classify soils. Corequisite: CE 3703

Corequisite: CE 3703.

**CE 3703 - Soil Mechanics (3)**

This course introduces geotechnical engineering and provides an overview of fundamental properties and behavior of soils. Topics include index properties, soil classification, compaction, phase relationships, subsurface exploration, effective stress, seepage, shear strength, bearing capacity, and consolidation. Prerequisite: ES 243; Corequisite: CE 3701

Prerequisite: ES 243. Corequisite: CE 3701.

**CE 3803 - Geology for Engineers (3)**

An introduction to the field of geology. Study of minerals and rocks and their formation, as well as geologic structure. Other topics will include soils, running water, and groundwater. Plate tectonics, glaciers, volcanoes, erosion, weathering, and geologic hazards are also covered. The impact of geology on engineering projects will also be discussed.

**CE 3903 - Introduction to Site Development (3)**

This course provides an overview of the site development process, integrating multiple civil engineering disciplines. Topics include the evaluation and application of ordinances and regulations and performing due diligence studies. Students will develop preliminary site plans showing the proposed layout, grading, and erosion control. Students will determine preliminary construction costs. Corequisite: At least 4 of the 7 junior level CE courses: CE 3103, CE 3203, CE 3303, CE 3503, CE 3603, CE 3703 or CE 3523

Corequisite: At least 4 of the 7 junior level CE courses: CE 3103, CE 3203, CE 3303, CE 3503, CE 3603, CE 3703 or CE 3523.

**CE 4103 - Pollution Control Technologies (3)**

This course explores and designs pollution control technologies for diverse environmental applications, including air pollution control, solid and hazardous waste management, and industrial wastewater treatment. It delves into strategies that prevent environmental pollution, examining methods to address contaminants in different media. Prerequisite: CE 3103

Prerequisite: CE 3103.

**CE 4113 - Environmental Remediation (3)**

This course examines soil, sediment, and groundwater that is contaminated with environmental pollutants. It evaluates contaminant fate and transport to help assess health risks to people and the natural environment and select appropriate remediation strategies. It also investigates environmental remediation technologies applicable to a wide variety of site conditions. Prerequisite: CE 3103

Prerequisite: CE 3103.

**CE 4123 - Water & Wastewater Treatment (3)**

This course addresses the design of drinking water treatment and municipal wastewater treatment plants. It highlights process fundamentals, focusing on applied physics and chemistry for drinking water treatment and applied physics and microbiology for wastewater treatment. Prerequisite: CE 3103

Prerequisite: CE 3103.

**CE 4303 - Open Channel Hydraulics (3)**

This course presents advanced topics in open-channel hydraulics, including designing hydraulic structures, rigid- and flexible-lined channels, gutters, and inlets. It includes analyzing uniform and gradually varied flow in prismatic and natural channels, as well as flood routing techniques. Prerequisite: CE 3303

Prerequisite: CE 3303.

**CE 4323 - Engineering Hydrology (3)**

Fundamental processes in the hydrologic cycle including precipitation, infiltration, evapotranspiration, and runoff. Quantitative approaches for engineering hydrology to estimate flows for a variety of design problems, including routing through detention basins and river reaches. Prerequisite: CE 3303

Prerequisite: CE 3303.

**CE 4333 - Design of Water Distribution Systems & Sewers (3)**

This course focuses on the theory and practical applications of pipe networks, particularly in the analysis and design of municipal water distribution systems. The course also includes wastewater flow analysis and the design of storm, sanitary, and combined sewer systems. Prerequisite: CE 3303

Prerequisite: CE 3303.

**CE 4503 - Structural Analysis II (3)**

This course introduces approximate analysis techniques for indeterminate structures and analyzes both determinate and indeterminate structures using matrix-based computer methods. It also presents fundamental concepts in structural dynamics, including the free and forced response of single degree-of-freedom systems. Prerequisite: Grade of "C" or better in CE 3503

Prerequisite: Grade of "C" or better in CE 3503.

**CE 4523 - Structural Design II (3)**

In this course, students will apply structural codes to design connections for steel structures, design reinforced concrete beams and columns for any cross-section, and design prestressed concrete beams. Prerequisite: Grade of "C" or better in CE 3523

Prerequisite: Grade of "C" or better in CE 3523.

**CE 4553 - Timber Design (3)**

Analysis, proportioning, and connection of structural members in timber. Lateral wind force resisting systems in timber structures. Specifications and codes. Prerequisite: CE 3503

Prerequisite: CE 3503.

**CE 4563 - Bridge Engineering (3)**

In this course, students will use the AASTHO LRFD Bridge Design Specification to design single-span bridges. Other topics include bridge aesthetics and notable bridge failures. Prerequisites: CE 3523 or permission of the instructor

Prerequisite: CE 3523 or permission of the instructor.

**CE 4603 - Highway Geometric Design (3)**

This course covers fundamental highway and street geometric design principles, emphasizing efficiency, safety, and compliance with national standards. It addresses the design of key elements, such as alignments, sight distance, and intersections, while considering social, economic, and environmental constraints. Prerequisite: CE 3603

Prerequisite: CE 3603.

**CE 4613 - Construction Methods & Equipment (3)**

Fundamental operations in construction and equipment selection. Building construction methods will include concrete, wood, steel, and masonry. Planning, scheduling, construction economics, and safety topics will comprise the construction management topics. Prerequisite: CE 3203

Prerequisite: CE 3203.

**CE 4703 - Topics In Geotechnical Engineering (3)**

Special topics frequently encountered in geotechnical practice. Topics may include soil and site improvement using deep dynamic compaction, vibroflotation, wick drains and geosynthetics; slope stability analyses; retaining wall design and geo-environmental concerns, such as environmental site assessments and waste liner/cover systems. Other topics may include special concerns in engineering geology. Prerequisite: CE 3703

Prerequisite: CE 3703.

**CE 4713 - Foundation Engineering (3)**

This course applies the principles of soil mechanics to analyze and design retaining walls and foundations. Topics include retaining walls, shallow footings, piles, drilled shafts, and intermediate foundations. Prerequisite: CE 3703

Prerequisite: CE 3703.

**CE 4723 - Pavement Design (3)**

This course covers the design of asphalt and concrete pavements for roads and airports. It includes pavement maintenance, overlays, permeable pavements, pavement recycling, and life-cycle cost analysis. Corequisite: CE 3203, CE 3703

Corequisite: CE 3203, CE 3703.

**CE 4901 - Special Problems in Civil Engineering (1)**

To be offered to students who have demonstrated superior ability. Course content to be arranged for the individual student according to his/her interest and aptitudes. Library research or independent study may be included. Prerequisites: Senior standing and permission of Department Chair

Prerequisite: Senior standing and permission of Department Chair.

**CE 4902 - Special Problems in Civil Engineering (2)**

To be offered to students who have demonstrated superior ability. Course content to be arranged for the individual student according to his/her interest and aptitudes. Library research or independent study may be included. Prerequisites: Senior standing and permission of Department Chair

Prerequisite: Senior standing and permission of Department Chair.

**CE 4903 - Special Problems in Civil Engineering (3)**

To be offered to students who have demonstrated superior ability. Course content to be arranged for the individual student according to his/her interest and aptitudes. Library research or independent study may be included. Prerequisites: Senior standing and permission of Department Chair

Prerequisite: Senior standing and permission of Department Chair.

**CE 4904 - Special Problems in Civil Engineering (4)**

To be offered to students who have demonstrated superior ability. Course content to be arranged for the individual student according to his/her interest and aptitudes. Library research or independent study may be included. Prerequisites: Senior standing and permission of Department Chair

Prerequisite: Senior standing and permission of Department Chair.

**CE 4911 - Capstone Design I (1)**

The culminating capstone design experience for Civil Engineering majors showcases program outcomes. Students work as a team utilizing project management strategies to investigate, examine, and formulate design solutions for a civil or environmental engineering problem. Designs incorporate acquired classroom knowledge, out-of-class learning, and sustainability concepts to simulate a "real world" design experience. The first semester of this two semester course focuses on project selection and planning, data acquisition, and out of class learning. Prerequisites: At least 4 of the 7 junior level CE courses, CE 3103, CE 3203, CE 3303, CE 3503, CE 3603, CE 3703, or CE 3523

Prerequisite: At least 4 of the 7 junior level CE courses, CE 3103, CE 3203, CE 3303, CE 3503, CE 3603, CE 3703, or CE 3523 .

**CE 4912 - Civil & Environmental Engineering Design Seminar (2)**

Design and decision-making by practicing civil engineers must incorporate a wide variety of external constraints, including sustainability, engineering ethics, public policy, and impact on the global society. This course prepares students so they can investigate, evaluate, and incorporate each of these types of external constraints for civil and environmental engineering projects. Prerequisite: At least 4 of the 7 junior level CE courses, CE 3103, CE 3203, CE 3303, CE 3503, CE 3603, CE 3703, or CE 3523

Prerequisite: At least 4 of the 7 junior level CE courses, CE 3103, CE 3203, CE 3303, CE 3503, CE 3603, CE 3703, or CE 3523 .

**CE 4913 - Capstone Design II (3)**

The culminating capstone design experience for Civil Engineering majors showcases program outcomes. Students work as a team utilizing project management strategies to investigate, examine, and formulate design solutions for a civil or environmental engineering problem. Designs incorporate acquired classroom knowledge, out-of-class learning, and sustainability concepts to simulate a "real world" design experience. A written report and a formal group presentation must effectively communicate design solutions to stakeholders and engineering professionals. Prerequisite: CE 4911 (Must be taken in the term immediately prior to taking 4913)

Prerequisite: CE 4911 (Must be taken in the term immediately prior to taking 4913).

**CE 4923 - Sustainability in Civil Engineering (3)**

An introduction to sustainability in Civil Engineering, addressing ethical responsibilities and considering global, economic, environmental, and social impacts. Students will evaluate real world examples, analyze a wide variety of engineering sustainability frameworks, and apply current sustainable engineering practices. Prerequisites: At least 4 of the 7 junior level CE courses: CE 3103, CE 3203, CE 3303, CE 3503, CE 3523, CE 3603, CE 3703

Prerequisite: At least 4 of the 7 junior level CE courses, CE 3103, CE 3203, CE 3303, CE 3503, CE 3523, CE 3603, CE 3703.

# CH-Chemistry

**CH 101 - General Chemistry I Laboratory (1)**

Fundamentals of chemistry with emphasis on atomic structure, stoichiometry, thermochemistry, properties of solution, properties of matter. The laboratory is quantitative in nature.

**CH 103 - General Chemistry I (no lab) (3)**

Fundamentals of chemistry with emphasis on atomic structure, stoichiometry, thermochemistry, properties of solutions, properties of matter. Non-laboratory science. Prerequisite: MA 113

Prerequisite: MA 113.

**CH 104 - General Chemistry I (4)**

Fundamentals of chemistry with emphasis on atomic structure, stoichiometry, thermochemistry, properties of solution, properties of matter. The laboratory is quantitative in nature. Prerequisite: MA 113

Prerequisite: MA 113. Corequisite: Lab Required.

**CH 114 - General Chemistry II (4)**

A continuation of CH 104. Emphasis is on chemical equilibria, thermodynamics, kinetics, acid-base reactions, electrochemistry, and properties of solutions. Includes laboratory time. Prerequisite: A 'C' or better in CH 104

Prerequisite: A 'C' or better in CH 104. Corequisite: Lab Required.

**CH 144 - Chemistry - Ideas & Applications (4)**

An integrated view of organic and biological chemistry for non-science majors, emphasizing the importance of chemistry to daily living and chemical principles related to everyday experiences. Simulated chemical problems in the laboratory. This course cannot be substituted for CH 104 or CH 114 for either science or engineering majors.

Prerequisite: None. Corequisite: Lab Required.

**CH 155H - Advanced Honors General Chemistry (5)**

An accelerated class that will focus on topics traditionally taught in a two semester general chemistry sequence. Topics include, but are not limited to, atomic structure, stoichiometry, gas laws, solution chemistry, thermochemistry, kinetics, chemical equilibria, acid-base reactions, and electrochemistry. Prerequisite: MA 113, high school chemistry, SAT OF 1120/ACT 27, high school GPA of 3.75

Prerequisite: MA 113, high school chemistry, SAT OF 1120/ACT 27, high school GPA of 3.75. Corequisite: Lab Required.

**CH 1003 - Fundamentals of Chemistry (3)**

An integrated view of general, organic, and biological chemistry for non-science majors, emphasizing the importance of chemistry to daily living and chemical principles related to everyday experiences. This course cannot be substituted for CH 104, CH 114, or CH 144 for either science or engineering majors. Taking MA 113 College Algebra or higher before this course is highly recommended.

Prerequisite: MA 113 College Algebra or higher is highly recommended.

**CH 202 - Introduction to Chemical Literature and Communication (2)**

A course focusing on the nature and use of chemical literature and the communication of scientific knowledge. The student will gain experience in searching the literature, analyzing and summarizing literature, properly citing and referencing sources,

and writing both a review article and a scientific research paper. Prerequisite: ENG 133 or ENG 143 or HUM 203 and one Chemistry course 200-Level or above

Prerequisite: ENG 133 or ENG 143 or HUM 203 and one Chemistry course 200-Level or above.

**CH 204 - Organic Chemistry I (4)**

A study of the methods of preparation, structure, and characteristic reactions of the more important type of aliphatic compounds, including industrial uses and methods of synthesis. This course also contains a laboratory portion where synthesis and experiments illustrative of the methods used in working with organic compounds are performed. Students must successfully complete both the lab and lecture portions to pass the course. Prerequisite: CH 114 or CH 155H

Prerequisite: CH 114 or CH 155H. Corequisite: Lab Required.

**CH 214 - Organic Chemistry II (4)**

A continuation of CH 204 with a study in a similar manner of aromatic compounds. This course also contains a laboratory portion illustrating the synthesis and reaction of aromatic compounds. Students must successfully complete both the lab and lecture portions to pass the course. Prerequisite: 'C' or better in CH 204

Prerequisite: 'C' or better in CH 204. Corequisite: Lab Required.

**CH 234 - Quantitative Chemical Analysis (4)**

A quantitative treatment of analytical chemistry with a focus on the approach to solving problems. Topics of discussion include: the recognition and evaluation of error, critical and statistical analysis of data, further studies of equilibrium (acid/base, buffers, solubility and electrochemistry), and the principles of chemical separation and spectroscopy. The laboratory portion reinforces material learned in the classroom by providing practical experience in the areas of volumetric, gravimetric, spectrophotometric, and chromatographic processes. Prerequisite: CH 114 or CH 155H

Prerequisite: CH 114 or CH 155H. Corequisite: Lab Required.

**CH 302 - Professional Practice Science (2)**

This course will provide students with the professional tools necessary to be successful in the fields of biology, chemistry, biochemistry, and forensic science. In this course, students will construct an application packet, research relevant literature, orally present information in a professional setting, and provide peers with constructive feedback. (Same as BIO 302) Prerequisite: CH 202; Junior Standing or Permission of the Chair

Prerequisite: CH 202; Junior Standing or Permission of the Chair.

**CH 312 - Fundamentals of Immunology (2)**

An introduction to immunology including the innate and adaptive immune systems. More emphasis will be on the adaptive immune system. Several key concepts will be linked to important topics such as the treatment and prevention of disease, transplantation of organs, and what happens when the immune systems breaks down. Prerequisites: CH 204 and BIO 324 (Same as BIO 312)

Prerequisite: CH 204 and BIO 324. Crosslisted as: BIO 312.

**CH 322 - Nuclear Chemistry (2)**

An introduction to nuclear chemistry. The course will look at the terminology involved, nuclear reactions, radioactivity, radiation measurement, and radiation toxicology. Applications such as power and medicine may also be discussed. Prerequisites: CH 114 and MA 134

Prerequisite: CH 114 General Chemistry II and MA 134 Calculus I.

**CH 324 - Chemical Instrumental Analysis (4)**

This course focuses on the principles and applications of modern instrumental methods of analysis. Topics include spectroscopy, chromatography, and mass spectrometric methods of analysis. Selected topics in the area of electrochemical, thermal and surface analytical techniques may also be explored. In the laboratory, students will gain practical hands-on instrumental experience reinforcing the concepts covered in the lecture. Prerequisites: CH 204 and CH 234

Prerequisite: CH 204 and CH 234. Corequisite: Lab Required.

**CH 332 - Medicinal Chemistry (2)**

Fundamentals of medicinal chemistry with emphasis on types and classifications of drugs, drug discovery process, structure activity relationships (SAR) case studies, effects of acidic and basic media on drug structure, sites of drug administration and interactions, drug metabolism pathways and mechanisms, and the process in which a drug becomes FDA approved. Prerequisite: CH 204

Prerequisite: CH 204.

**CH 342 - Metals in Biology (2)**

This course will introduce students to important biochemistry and inorganic chemistry concepts, such as preferred ligands and binding geometry for different metal ions, and then cover more in-depth topics on the importance of metal ions in life. These topics will include protein structure, small-molecule transport, catalysis and metal ion uptake, transport, and storage. A survey of the toxicity of metal ions and how their medicinal uses (such as chemotherapy) will also be presented. Prerequisite: CH 204; Crosslisted with BIO 342

Prerequisite: CH 204 Organic Chemistry I and Laboratory.

**CH 344 - Inorganic Chemistry (4)**

Structure and bonding in main group and transition metal coordination compounds with an accompanying discussion of the electronic structure of the d-orbitals, group theory, and descriptive chemistry of the elements. The laboratory portion includes experiments examining the nature of bonding in transition metal complexes, the spectrochemical series, spectroscopic properties of coordination compounds, ligating ability of ligands, acid/base models, and catalysis. Prerequisite: CH 204

Prerequisite: CH 204. Corequisite: Lab Required.

**CH 354 - Physical Chemistry I (4)**

An in-depth study in real gases, thermodynamics, kinetics, chemical and physical equilibrium, and electrochemistry. Laboratory contains experiments in these areas. Prerequisites: CH 114 or CH 155H, MA 213, PH 224

Prerequisite: CH 114 or CH 155H, MA 213, PH 224. Corequisite: Lab Required.

**CH 364 - Toxicology (4)**

The methods and design of both acute and chronic toxicity tests will be surveyed. Probits of percent mortality versus log dose and other appropriate statistical methods of toxin analysis are applied to laboratory data. Emphasis will be given to mechanisms of action and metabolic detoxification and elimination. Federal regulations involving manufacture use categories and proper disposal are reviewed. (SAME AS BIO 364) Prerequisites: BIO 114 or ES 141; CH 204. Recommended: BIO/CH 434

Prerequisite: Required: BIO 114 or ES 141; CH 204 Recommended: BIO/CH 434. Corequisite: Lab Required. Crosslisted as: BIO 364.

**CH 374 - Physical Chemistry II (4)**

Fundamentals of quantum theory of atoms and molecules, and spectroscopy. Laboratory contains experiments in these areas. Prerequisite: CH 354

Prerequisite: CH 354. Corequisite: Lab Required.

**CH 434 - Biochemistry I (4)**

The chemical and physical behavior of biologically important compounds such as carbohydrates, lipids, proteins, nucleic acids, and enzymes are discussed. The various metabolic pathways are discussed in light of their organic mechanisms. (Same as BIO 434) Prerequisites: BIO 114 or ES 141; CH 204

Prerequisite: BIO 114 or ES 141; CH 204. Corequisite: Lab Required. Crosslisted as: BIO 434.

**CH 444 - Biochemistry II (4)**

A second semester in Biochemistry would include topics in biosynthesis of the following: amino acids; purines and pyrimidines; proteins; nucleic acids. Topics in nitrogen metabolism and control of protein synthesis would also be discussed. Laboratories would supplement the lecture material. Prerequisites: BIO 434 or CH 434 (Same as BIO 444)

Prerequisite: BIO 434 or CH 434. Corequisite: Lab Required. Crosslisted as: BIO 444.

**CH 474 - Forensic Chemistry (4)**

The course includes a discussion of the analytical, quantitative and qualitative chemical procedures required for preparation of circumstantial evidence from laboratory analysis for prosecution of court cases. Statistical methods, particularly proper sampling, data handling, and quality control procedures are discussed. Quality assurance (QA), quality control (QC), and total quality management (TQM) are explored in some detail. Laboratory procedures will include wet chemistry and spot testing as well as use of thin layer chromatography, gas chromatography with mass spectrometry and nitrogen/phosphorous detectors, FT-infrared (ATR) and Raman spectroscopy, polarizing microscopy, and other instrumental techniques. The instruments are used by the students to analyze materials typical of the case load of forensic laboratories: drug surrogates, accelerants, colorants and pigments, inks and paints, and polymers, fibers and plant materials. Prerequisite: CH 204 and CH 234

Prerequisite: CH 204 and CH 234. Corequisite: Lab Required.

**CH 4001 - Special Assignments in Chemistry (1)**

Directed readings, independent study, or research. Prerequisite: Permission of the Department Chair

Prerequisite: Permission of the Department Chair.

**CH 4002 - Special Assignments in Chemistry (2)**

Directed readings, independent study, or research. Prerequisite: Permission of the Department Chair

Prerequisite: Permission of the Department Chair.

**CH 4003 - Special Assignments in Chemistry (2)**

Directed readings, independent study, or research. Prerequisite: Permission of the Department Chair

Prerequisite: Permission of the Department Chair.

**CH 4004 - Special Assignments in Chemistry (4)**

Directed readings, independent study, or research. Prerequisite: Permission of the Department Chair

Prerequisite: Permission of the Department Chair.

**CH 4005 - Special Assignments in Chemistry (5)**

Directed readings, independent study, or research. Prerequisite: Permission of the Department Chair

Prerequisite: Permission of the Department Chair.

**CH 4006 - Special Assignments in Chemistry (4)**

Directed readings, independent study, or research. Prerequisite: Permission of the Department Chair

Prerequisite: Permission of the Department Chair.

# CHE-Chemical Engineering

**CHE 122 - Introduction to Chemical Engineering (2)**

This course is an introduction to Chemical Engineering calculations and concepts. Course topics include unit conversions, process variables, algebraic systems of equations, and spreadsheet operations applied toward single unit material balance systems. Corequisite: GE 101

Corequisite: GE 101 Introduction To Engineering.

**CHE 203 - Material Balances (3)**

This course is an introduction to the practice of chemical engineering. Fundamental principles are applied to chemical engineering problems involving conservation of mass. Stoichiometry is also reviewed. Process flow diagrams and piping and instrumentation diagrams will be presented. Prerequisite: C or better in both CH 104 and CH 114 or CH 155H; Corequisite: PH 224

Prerequisite: C or better in both CH 104 and CH 114 or CH 155H; Corequisite: PH 224. Corequisite: PH 224.

**CHE 204 - Material and Energy Balances (4)**

This course is an introduction to the practice of chemical engineering. Fundamental principles are applied to chemical engineering problems involving conservation of mass and energy. Stoichiometry is also reviewed. Process flow diagrams are presented. Prerequisite: "C" or better in CH 104 OR CH 155H

Prerequisite: "C" or better in CH 104 OR CH 155H.

**CHE 212 - Energy Balances (2)**

This course is a continuation of CHE 203 with an emphasis on problems involving the conservation of mass and energy. Prerequisite: C or better in CHE 203; Corequisite: CHE 222

Prerequisite: C or better in CHE 203; Corequisite: CHE 222. Corequisite: CHE 222.

**CHE 222 - Sustainability & Process Measurement Laboratory (2)**

This laboratory introduces students to the process of writing laboratory reports. The laboratory includes the measurement of process variable and the reinforcement of fundamental concepts related to conservation principles. Statistical analysis of data is included. Safety and sustainability is also covered. Corequisite: CHE 212; Prerequisite: CHE 252

Prerequisite: CHE 252. Corequisite: CHE 212.

**CHE 223 - Measurements and Instrumentation (3)**

This course covers the principles and operation of chemical engineering instrumentation for measuring process variables, as well as safety issues and experimental procedures. Students will learn to develop, conduct and communicate experiment procedures to meet high level objectives. Students will conduct, analyze, interpret data and present the results of those experiments. Students will also gain an understanding of statistical analysis methods commonly used in chemical engineering experiments, as well as the fundamentals of electrical theory as it applies to measurement sensors. Prerequisite: CHE 204

**CHE 252 - Introduction to Statistical & Computational Methods in Chemical Engineering (2)**

Spreadsheets and mathematical worksheets, both computer and mobile application based, will be used extensively for the calculation and analysis of chemical processes. Statistics will be introduced in the context of chemical process and product

analysis. Corequisite: CHE 203

Corequisite: CHE 203.

**CHE 253 - Chemical Engineering Calculations (3)**

The purpose of this course is to equip students with the essential skills and knowledge necessary to perform a wide range of chemical engineering calculations. Students will learn how to use modern engineering calculation tools, including general-purpose spreadsheets, programming languages, and mathematical and statistical software, to set up, solve, and interpret material and energy balance problems. Additionally, this course will cover the basics of data analysis and equation fitting, utilizing statistical software. By the end of this course, students will have a solid foundation in using computational tools to solve chemical engineering problems and analyze experimental data. Prerequisite: CHE 204; Corequisite: CS 1113

Prerequisite: CHE 204. Corequisite: CS 1113.

**CHE 303 - Chemical Engineering Fluid Dynamics (3)**

Fluid mechanics applied to chemical processes will be introduced. Topics include fluid statics, rheological properties of fluids, laminar and turbulent flow in compressible and incompressible systems. Transfer equipment will also be introduced as well as the concept of net positive suction head. Fluid transport system design will be included. Prerequisite: C or better in CHE 204

Prerequisite: C or better in CHE 204. Corequisite: None.

**CHE 313 - Chemical Engineering Thermodynamics I (3)**

This course will review the laws of thermodynamics and introduce students to thermodynamic cycles and systems. Equations of state for single component systems are introduced. Estimation of physical and thermodynamic properties will be covered. Prerequisite: C or better in CHE 204; Corequisite: MA 164

Prerequisite: C or better in CHE 204. Corequisite: MA 164.

**CHE 333 - Unit Operations Laboratory (3)**

A laboratory course to study both heat transfer and fluid flow. Identification prevention and mitigation of laboratory and industrial hazards will be covered. Statistics and technical writing are required. Prerequisites: ENG 133, CHE 223, CHE 303, and CHE 373

Prerequisite: ENG 133, CHE 223, CHE 303, and CHE 373. Corequisite: None.

**CHE 363 - Chemical Engineering Thermodynamics II (3)**

Phase and chemical reaction equilibrium will be covered in this course.  Emphasis is placed on multicomponent non-ideal systems. Prerequisite: CHE 313

Prerequisite: CHE 313. Corequisite: None.

**CHE 372 - Chemical Engineering Thermodynamics II (2)**

Phase and ChemicalReaction equilibrium will be covered in this course. Emphasis is placed on multi-component non-ideal systems. Prerequisite: CHE 313

Prerequisite: CHE 313.

**CHE 373 - Chemical Engineering Heat Transfer (3)**

Heat transfer will be studied and applied to chemical processes. Heat transfer coefficient prediction with and without phase change will be included. Commercially available heat transfer equipment will be studied. Radiation heat transfer, evaporation as well as unsteady state heat transfer will be studied. A design project involving heat transfer equipment will be included in this class. Prerequisite: C or better in CHE 204

Prerequisite: C or better in CHE 204. Corequisite: None.

**CHE 383 - Mass Transfer (3)**

This course will study the phenomena of mass transfer as it relates to chemical separation processes. Diffusion coefficients and mass transfer coefficients will be introduced and estimated. Rate based separation calculations will be studied. Applications include absorption and cooling water towers. Prerequisite: CHE 373 and CHE 313

Prerequisite: CHE 373 and CHE 313.

**CHE 393 - Stagewise Separations (3)**

The design and characterization of stage-wise and continuous separation processes are covered in this course. Both graphical and rigorous numerical techniques are used. Applications include distillation, absorption, stripping and liquid-liquid extraction. Prerequisite: CHE 313

Prerequisite: CHE 313. Corequisite: None.

**CHE 412 - Applied Numerical Methods (2)**

Advanced engineering mathematics will be introduced. Numerical techniques will be discussed and applied to chemical engineering problems. Prerequisite: CHE 453

Prerequisite: CHE 453.

**CHE 433 - Unit Operations Laboratory II (3)**

This is a laboratory course devoted to the study of mass transfer and chemical reaction kinetics. Statistical techniques will be integrating into these experiments along with statistical design of experiments. Prerequisite: CHE 333 and CHE 393

Prerequisite: CHE 333 and CHE 393.

**CHE 453 - Chemical Engineering Kinetics (3)**

A study of chemical reaction processes with applications to equipment design. Prerequisites: CHE 383, CHE 393, MA 233

Prerequisite: CHE 383, CHE 393, MA 233.

**CHE 463 - Chemical Process Dynamics & Control (3)**

An introduction to process dynamics and the application of control systems. Prerequisite: MA 233

Prerequisite: MA 233. Corequisite: Lab Required.

**CHE 473 - Chemical Process Design I (3)**

Starting with the big picture students add greater detail in a top down, evolutionary and generally circular feedback design process. Design heuristics, cost estimation, simulation, safety, and economic analysis are covered as well as project optimization, documentation, reporting and presentation. Prerequisites: CHE 363 and CHE 383 and CHE 393

Prerequisite: CHE 363, CHE 383 and CHE 393. Corequisite: None.

**CHE 483 - Chemical Process Design II (3)**

Capstone design experience unifying the principles of previous coursework. Comprehensive projects that incorporate appropriate engineering standards and multiple realistic constraints. Prerequisites: CHE 453, CHE 473, and ES 382

Prerequisite: CHE 453, CHE 473, and ES 382.

**CHE 4001 - Special Problems in Chemical Engineering (1)**

Course content arranged according to the student's abilities and with the permission of the Chair of the department. No student

may pursue this course off campus during his or her last semester prior to graduation.

**CHE 4002 - Special Problems in Chemical Engineering (2)**

Course content arranged according to the student's abilities and with the permission of the Chair of the department. No student may pursue this course off campus during his or her last semester prior to graduation.

**CHE 4003 - Special Problems in Chemical Engineering (3)**

Course content arranged according to the student's abilities and with the permission of the Chair of the department. No student may pursue this course off campus during his or her last semester prior to graduation.

**CHE 4004 - Special Problems in Chemical Engineering (4)**

Course content arranged according to the student's abilities and with the permission of the Chair of the Department. No student may pursue this course off campus during his or her last semester prior to graduation.

**CHE 4073 - Biochemical Engineering (3)**

Microbiological and biochemical phenomena are treated from an engineering standpoint. Course topics include an overview of basic biological concepts along with the modern techniques of biotechnology. Mathematical models of enzyme and whole cell systems are derived and discussed. Commercial and laboratory reactors, as well as separation techniques, are studied. Prerequisite: CHE 222 or BME 3202 (CHE 4073 same as BME 4303)

Prerequisite: CHE 222 or BME 3202. Crosslisted as: BME 4303.

**CHE 4083 - Plant Management (3)**

A comprehensive overview of the factors and issues which must be considered for the successful management and operation of a chemical plant. Typical areas addressed include process evaluation and optimization, maintenance operations and planning, environmental pollution control and hazardous waste management, manufacturing economics, plant safety, labor relations, community relations, and regulatory compliance. Prerequisite: Junior standing

Prerequisite: Junior standing.

**CHE 4173 - Bio-Separation Processes (3)**

This course will examine the fundamentals of separation processes used to isolate and purify biochemical products such as whole cells, enzymes, food additives, and pharmaceuticals. Topics to be discussed include cell disruption, centrifugation, filtration, membrane separations, extraction, and chromatographic separation processes. The laboratory portion of the course will include experiments covering the above topics. Prerequisites: CHE 303 or BME 4603

Prerequisite: CHE 303 or BME 4603.

**CHE 4193 - High Polymer Processes (3)**

The chemical and engineering aspects of high-polymers, structure, property, and relationships. Physical methods of characterizing high polymers, basic chemistry and kinetics of polymerization reactions, industrial polymerization processes. Compounding and processing of plastics and elastomers, molding, extrusion, and other polymer-manipulation techniques. Prerequisites: CH 204

Prerequisite: CH 204.

**CHE 4273 - Pharmaceutical Processes (3)**

The objective of this course is to provide students with an overview of the pharmaceutical process industry from an engineering standpoint. Special emphasis will be given to biologically derived pharmaceuticals. Topics in the course include the drug discovery, drug development, and drug manufacturing processes, including cGMP. The course also covers fermentation selection, operation and control, and unit operations associated with recovery and purification. The course concludes with finished product preparation and packaging. The laboratory time will be used to tour pharmaceutical production facilities.

Prerequisites: CHE 303 or BME 4603

Prerequisite: CHE 303 or BME 4603.

# CHN-Chinese

**CHN 113 - Chinese I (no-native speakers) (3)**

An introduction to the Mandarin Chinese language and Chinese culture. Pronunciation, alphabet, and basic grammar skills are emphasized. No previous study of Chinese is required.

**CHN 123 - Chinese II (3)**

An advanced introduction to Mandarin Chinese language and Chinese culture. Pronunciation, alphabet, and basic grammar skills are emphasized. Prerequisite: CHN 113 or by placement

Prerequisite: CHN 113 or by placement.

# CO-Cooperative Education

**CO 050 - Co-Op Employment (0)**

For cooperative education (Co-op) students only. Co-op employment in a professional environment with emphasis on training oriented to students who are majoring in an engineering, environmental science, or computer science program. Co-op students must pre-register for this course before each semester's work assignment. The final cooperative education (Co-op) work assignment must be within the calendar year prior to graduation. While enrolled in this course, a student is considered a full-time Trine University student. Prerequisite: Sophomore standing with a minimum GPA of 2.4

Prerequisite: Sophomore standing with a minimum GPA of 2.4.

**CO 451 - Co-Op Work Experience (1)**

To obtain cooperative education endorsement on the degree, the student must register for this course. While enrolled in this course, the student must complete a formal report on his/her co-op work experience. The report must be completed by the eighth week of the semester. Prerequisites: Three semesters of CO 050

Prerequisite: Three semesters of CO 050 .

**CO 452 - Co-Op Work Experience (2)**

To obtain cooperative education endorsement on the degree, the student must register for this course. While enrolled in this course, the student must complete a formal report on his/her co-op work experience. The report must be completed by the eighth week of the semester. Prerequisites: Three semesters of CO 050

Prerequisite: Three semesters of CO 050 .

**CO 453 - Co-Op Work Experience (3)**

To obtain cooperative education endorsement on the degree, the student must register for this course. While enrolled in this course, the student must complete a formal report on his/her co-op work experience. The report must be completed by the eighth week of the semester. Prerequisites: Three semesters of CO 050

Prerequisite: Three semesters of CO 050.

# COM-Communication

**COM 102 - Professional Practice I (2)**

Students gain entry-level media experience working as interns for the department media team and shadowing campus media

outlets. Course includes 1 credit of in-class instruction per week and 30 hours of practical experience.

**COM 111 - Practices & Professions (1)**

This course introduces students to the Communication field with hands on experience in a variety of communicative modes (for example, video, broadcast, marketing, web content, etc.). The course often partners closely with Trine University Offices to provide students with real world, practical experience.

Prerequisite: None. Corequisite: None. Crosslisted as: none.

**COM 123 - History of the Media (3)**

An examination of the history of the media stressing the nature, controls under which they operate, economic and political foundations, social implications, and its future roles.

**COM 153 - Principles of Public Relations (3)**

Students will examine the history, nature, and types of public relations. Students will gain an understanding in the importance of research, planning, executing, and evaluating a multitude of PR affordances and constraints based on client needs and abilities. This course will also allow students to create, analyze, and evaluate different genres of PR writing across multiple media outlets.

Prerequisite: None. Corequisite: None.

**COM 163 - Interpersonal Communication (3)**

Students in this course will apply communication concepts and principles to interpersonal communication. Students will use communication exercises, role playing, and case studies throughout this course. Students will analyze communication dynamics and improve communication skills through language, nonverbal communication, listening, perception of self and others, relationship development, and assertiveness.

Prerequisite: None. Corequisite: None.

**COM 183 - Writing For The Media (3)**

Introduction to writing for the media (print, broadcast, online). Course examines Associated Press (AP) style, as well as techniques for newsgathering, writing headlines, the inverted pyramid structure, and other forms of media communication. Prerequisite: ENG 143 or ENG 133

Prerequisite: ENG 143 or ENG 133.

**COM 202 - Professional Practice II (2)**

Students gain intermediate-level experience in lens-based media (including photography and video) with one of the campus communication outlets. Course includes 1 credit of in-class instruction per week and 30 hours of practical experience. Prerequisite: COM 102

Prerequisite: COM 102.

**COM 203 - Media & Society (3)**

A systematic approach to mass media in terms of structure, functions and effects; includes such topics as meaning, perception, selectivity, ethics persuasion, subliminal seduction, violence and erotica, political socialization, learning, agenda-setting, and uses and gratifications. Prerequisite: ENG 143 or ENG 133

Prerequisite: ENG 143 or ENG 133.

**COM 213 - Business Communication (3)**

This course provides students with an introduction to effective research, writing, and document design in relation to business

and professional communication. Students will be expected to develop a basic understanding of business communication norms and the different genres of composition found in a workplace setting. Students will employ multiple modes of communication to best fit their intended audience. Prerequisite: ENG 143 English Composition or ENG 133 Technical Communication

Prerequisite: ENG 143 English Composition or ENG 133 Technical Communication. Corequisite: None. Crosslisted as: None.

**COM 233 - Intercultural Communication (3)**

Considers interrelationships between communication and culture, the diversity between and within cultures, and both the challenges and rewards of intercultural communication practice. Topics include cultural patterns, worldview and perception, cultural identity, verbal and nonverbal communication, listening, family and relationships, and business.

**COM 243 - Digital Media Creation (3)**

Various forms of digital media will be used to create stories and content. Students will capture photo, video, and audio content and use industry standard software to edit content. Students will be introduced to principles of visual communication, including best practices and laws that impact media use and creation. Prerequisite: COM 303 or Permission from Instructor and/or Chair

Prerequisite: COM 303 or Permission from Instructor and/or Chair.

**COM 253 - Event Planning & Promotion (3)**

Considers event planning and promotion as typical duties for public relations, event coordinators, and development professionals. While considering event goals, budget, and audience, students will develop committees, event and production timelines, and consider PR, environment, volunteer management, risk assessments and more. Students will plan, develop, promote, and execute a substantial event. Prerequisite: COM 153 or sophomore standing

Prerequisite: COM 153 or sophomore standing. Corequisite: None. Crosslisted as: None.

**COM 263 - Communication Research (3)**

The goal of this course is to provide students with a foundational understanding of research methods in the field of Communication studies. By the end of this course, students will be able to depict what is good and bad scholarship, how to design their own research study, and how to approach ethical analysis for practical application.

Prerequisite: None. Corequisite: None. Crosslisted as: None.

**COM 273 - Video Production (3)**

Introduction to basic digital video production skills. All elements of production will be explored from pre-production, production, and post-production. Script writing, storyboarding, camera operations and techniques, framing, lighting, sound, and video editing will be covered through concrete examples and hands-on projects. Course culminates in a final project which students can use as part of their professional portfolios.

**COM 293 - Argumentation & Debate (3)**

This course provides students with an introduction into the world of argumentation and debate. Students are expected to analyze, explain, and argue in a variety of debate styles (including but not limited to refutation and policy). Students will use reason, research, and logic to shape their respective arguments for appropriate audiences. Prerequisite: SP 203 or permission of Chair

Prerequisite: SP 203 or permission of Chair.

**COM 301 - Media Practicum (1)**

Students will gain practical media experience through working for the HAC Media Team, the Trine University Marketing Department, The Trine Broadcasting Network, or another approved media-oriented work experience for a total of 30 hours. May be repeated, but only if duties and skills learned are different each time, up to a total of three credits. Prerequisite: Communication major or minor, or permission of Chair

Prerequisite: Communication major or minor, or permission of Chair.

**COM 302 - Professional Practice III (2)**

Students will gain intermediate to advanced-level experience in broadcast media with one of the campus communication outlets. Course includes 1 credit of in-class instruction per week and 30 hours of practical experience. Prerequisite: COM 202

Prerequisite: COM 202.

**COM 303 - Digital Photography (3)**

Designed as an introduction to photography, this course examines the relationship and role of the photograph, the photographer, and the viewer through active class discussions, photographic assignments, and critiques. This class will cover the fundamentals of digital imaging including: basic camera functions, file types, file management, and digital editing. Students will produce a body of work by the end of class. This is a more hands-on, laboratory class and, as such is not a humanities elective.

**COM 343 - Web Content Management (3)**

Throughout this course, students will create a website using web content management software. Students will compare website content from personal and business websites. Students will also examine search engine optimization and create a brand message to improve website traffic and performance.

Prerequisite: Junior standing. Corequisite: None.

**COM 353 - Public Relations Writing & Production (3)**

This course provides students with advanced knowledge concerning writing, designing, and production in various public relation genres of communication. Students will be able to evaluate, analyze, and produce effective persuasive materials using both written and multimodal forms of communication. By the end of this class, students will be able to effectively create workplace appropriate public relations documentation for a multitude of publics. Prerequisite: COM 153 or permission of Chair.

Prerequisite: COM 153 or permission of Chair. Corequisite: None. Crosslisted as: None.

**COM 363 - Rhetoric and Persuasion (3)**

This course considers a variety of rhetorical theories (i.e. Marxism, Feminism, Psychoanalytic) and concepts that highlight functions of persuasion. Students will engage with how rhetoric affects and frames a person's construction of reality. This will be done through the lenses of multiple modes, such as print, video, sound, and image. Prerequisite: ENG 143 or ENG 133

Prerequisite: ENG 143 or ENG 133.

**COM 373 - Topics In Communication (3)**

Detailed survey of one of the major areas within the discipline of communication. The course changes each time it is offered, with the specific topic announced in the class schedule. Prerequisite: ENG 143 or ENG 133

Prerequisite: ENG 143 or ENG 133.

**COM 383 - Advanced Writing for the Media (3)**

Course examines feature style writing such as features, reviews, interviews, profiles, and more across print, broadcast, and online media. Prerequisite: COM 183

Prerequisite: COM 183.

**COM 393 - Design Thinking (3)**

This course explores theories and methods of design thinking with an emphasis on digital communication. Interdisciplinary and

collaborative in nature, design thinking uses a human-centered, divergent thinking approach to creatively investigate, identify, and solve complex problems. Students will participate in a series of problem-solving exercises and project challenges that require innovating existing products and materials by using a holistic design thinking process. Prerequisite: MK 373 or COM 243 or permission of Department Chair

Prerequisite: MK 373 or COM 243 or permission of Department Chair.

**COM 402 - Professional Practice IV (2)**

Students develop web-based professional portfolios, identify potential post-graduation jobs, and create application materials. Prerequisite: COM 302

Prerequisite: COM 302.

**COM 413 - Corporate & Organizational Communication (3)**

Principles and skills for effective communication within task-oriented teams, nonprofit organizations, and corporations. Considers communication techniques to improve meetings, problem-solving, decision-making, and communication climate, while fostering cohesiveness and productivity. Also considers the role of communication consultants and trainers and of internal media such as newsletters, brochures, and electronic communication. Team projects apply techniques and refine communication skills essential for internal contexts. Teams conduct a client-based communication audit or ethnography of an organization or corporate office. Participation in development of content for the Triangle, the Modulus, and/or WEAX is also required. Prerequisite: COM 213 or ENG 133

Prerequisite: COM 213 or ENG 133.

**COM 433 - Media Law & Ethics (3)**

The law as it affects journalism and broadcasting. History and background of the freedom of the press and broadcast industries with emphasis on First Amendment and FCC regulations, including such areas as seditious libel, libel, obscenity, privacy, copyright, advertising and the Fairness Doctrine. This course also examines the place of ethics in media production and distribution. Prerequisite: COM 123

Prerequisite: COM 123.

**COM 453 - Public Relations Planning & Campaigns (3)**

Knowledge and skills needed in the public relations planning, decision-making, and problem-solving process of research, objectives, programming, and evaluation. Case studies and problems apply planning and execution of PR campaigns and relations with a variety of publics: media, employees, members, communities, government and the public, investors, consumers, international, and special groups. Includes crisis and emergency PR and PR aspects of integrated marketing communications. Individuals develop oral and written client-based campaign proposals to solve problems or to utilize opportunities, while teams develop and execute a short term PR campaign for a campus or community client. Prerequisite: COM 153

Prerequisite: COM 153.

**COM 483 - Public Affairs Reporting (3)**

Advanced analysis of writing in the media. Examining public affairs style reporting, in particular, such as politics, government, social issues, public policy, and more across print, broadcast, and online media. Prerequisite: COM 183

Prerequisite: COM 183.

**COM 4001 - Elective Internship in Communication (1)**

Elective internship with variable credit of from one to three hours, with a minimum of 40 hours of work per credit hour. May be repeated for credit with a different internship, with a maximum of six hours of elective internship credit. Prerequisites: Communication major, 2.5 G.P.A., Permission of Advisor

Prerequisite: Communication major, 2.5 G.P.A., Permission of Advisor.

**COM 4002 - Elective Internship in Communication (2)**

Elective internship with variable credit of from one to three hours, with a minimum of 40 hours of work per credit hour. May be repeated for credit with a different internship, with a maximum of six hours of elective internship credit. Prerequisites: Communication major, 2.5 G.P.A., Permission of Advisor

Prerequisite: Communication major, 2.5 G.P.A., Permission of Advisor.

**COM 4003 - Elective Internship in Communication (3)**

Elective internship with variable credit of from one to three hours, with a minimum of 40 hours of work per credit hour. May be repeated for credit with a different internship, with a maximum of six hours of elective internship credit. Prerequisites: Communication major, 2.5 G.P.A., Permission of Advisor

Prerequisite: Communication major, 2.5 G.P.A., Permission of Advisor.

**COM 4013 - Senior Capstone Internship in Communication (3)**

An internship including capstone requirements, such as submission of a proposal and of written and oral final reports, requiring a minimum of 100 hours of work. Prerequisites: Senior Communication major, 2.5 G.P.A.

Prerequisite: Senior Communication major, 2.5 G.P.A. .

**COM 4101 - Independent Studies In Communication (1)**

An individualized reading and research project in the communication discipline. Prerequisite: Permission of the Department Chair

Prerequisite: Permission of the Department Chair.

**COM 4102 - Independent Studies In Communication (2)**

An individualized reading and research project in the communication discipline. Prerequisite: Permission of the Department Chair

Prerequisite: Permission of the Department Chair.

**COM 4103 - Independent Studies In Communication (3)**

An individualized reading and research project in the communication discipline. Prerequisite: Permission of the Department Chair

Prerequisite: Permission of the Department Chair.

**COM 4104 - Independent Studies In Communication (4)**

An individualized reading and research project in the communication discipline. Prerequisite: Permission of the Department Chair

Prerequisite: Permission of the Department Chair.

**COM 4281 - Senior Communication Project Proposal (1)**

Application of communication principles and skills by planning and developing a formal proposal for a capstone communication campaign or project. Prerequisite: Senior Communication major

Prerequisite: Senior Communication major.

**COM 4292 - Senior Communication Project (2)**

Application of communication principles and skills by implementing and evaluating a capstone communication campaign or project. Prerequisite: COM 4281

Prerequisite: COM 4281.

# COV-Community Volunteer

**COV 101 - Community Volunteer (1)**

Students perform volunteer work assisting and advancing adult literacy in Steuben County under the direction of the Steuben County Literacy Coalition. The course is graded on a pass/fail basis and may be taken twice.

# CR-Clinical Research

**CR 5003 - Principles of Clinical Research (3)**

This course introduces students to the fundamental principles of clinical research, emphasizing the design and analysis of clinical studies. It covers various study designs, methodological considerations, data analysis techniques, and interpretation of results in clinical research.

**CR 5013 - Clinical Regulatory Affairs (3)**

This course focuses on the ethical and regulatory frameworks governing human and animal subject research. It covers the principles and practices of ethical research conduct, the role and application of regulatory guidelines, informed consent processes, and the protection of vulnerable populations in clinical studies.

**CR 5023 - Managing & Monitoring Clinical Trials (3)**

This course explores strategic management principles of the clinical research industry. It emphasizes strategies for successful management and leadership in the evolving landscape of clinical research. The course covers strategic planning, decision-making processes, and solving challenges in the clinical research sector.

# CRJ-Criminal Justice

**CRJ 103 - Introduction to Criminal Justice (3)**

This course introduces students to the United States criminal justice system and how the system responds to criminality. Throughout the course, students will examine the processes, institutions, and administration of the justice system in the United States. Additionally, students will learn the purpose and history of key elements of the criminal justice system including policing, courts, and corrections.

**CRJ 133 - Criminal Justice Report Writing (3)**

This is in introductory course to research in the field criminal justice. Learners will identify the required sections of case briefs, formal reports, memorandas, and other legal documents and how to develop them. APA formatting and research writing will also be covered. Prerequisite: ENG 143

Prerequisite: ENG 143.

**CRJ 153 - Juvenile Justice (3)**

Throughout this course, students will review the nature and causation of juvenile delinquency. Additionally, students will examine the legal and ethical frameworks of juvenile justice processes, procedures, and treatment. This course also explores juvenile rights and juvenile delinquency prevention and rehabilitation.

**CRJ 243 - Introduction to Criminology (3)**

This course will cover the scientific study of the criminal justice systems. Learners will assess crime from a social view to identify nature and extent of crime, causes of crime, impact of crime on society and prevention of crime. Prerequisite: CRJ 103

Prerequisite: CRJ 103.

**CRJ 263 - Introduction to Criminal Law & Justice (3)**

Students in this course will analyze the general principles and specific crimes of criminal law. Throughout this course, students will also examine the interrelationships between local, state, and national agencies and their crime statutes.

**CRJ 273 - Criminal Procedure & Evidence (3)**

Students will examine the components of criminal procedures including their constitutional basis and use in court decisions. Throughout this course, students will also explore the impact of specific criminal procedures on the criminal justice system. Specific procedures explored include: sources of rights, levels of proof, limitations on governmental power in areas of arrest, search and seizures, confessions and admissions, basic constitutional rights of the accused, and legal liabilities of law enforcement officers.

**CRJ 343 - Criminalistics & Crime Scene Investigations (3)**

Throughout this course, students will explore basic concepts from the field of forensic science including how math and science are used in the collection and analysis of evidence. Terminology, criminalistic processes, and the importance of proper evidence handling will also be studied. Additionally, students will identify the significance of evidence collection and how evidence is interpreted in the justice system.

Crosslisted as: FS 343.

**CRJ 363 - Institutional Corrections & Law (3)**

Students in this course will review institutional corrections and punishment (penology). This course will provide students with the historic and contemporary views of jails and prisons. Students will examine the importance of evidence-based rehabilitation programming on the justice system. Additionally, students will analyze legislation and appellate decisions in correctional law for pretrial, convicted, and sentenced prisoners including death penalty sentences. Prerequisite: Junior standing or permission of instructor

Prerequisite: Junior standing or permission of instructor.

**CRJ 403 - Evidence Dissection & Processing (3)**

This course encompasses the criminal justice practitioner experience in the scientific study of cold case suspect development. Learners will evaluate and appraise cold case evidence to extrapolate applicable critical information and data to advance in the investigative process. Prerequisites: CRJ 243 and CRJ 453

Prerequisite: CRJ 243 Introduction to Criminology; CRJ 453 Topics in Criminal Justice: Cold Case Investigations. Corequisite: n/a. Crosslisted as: n/a.

**CRJ 413 - Suspect Development & Elimination (3)**

This course encompasses the criminal justice practitioner experience in the scientific study of cold case suspect development. Learners will explore the science of suspectology while employing inductive and deductive reasoning approaches in the evaluation of criminal behavior. Prerequisites: CRJ 243 and CRJ 453

Prerequisite: CRJ 243 Introduction to Criminology; CRJ 453 Topics in Criminal Justice: Cold Case Investigations. Corequisite: n/a. Crosslisted as: n/a.

**CRJ 423 - Criminal Justice Agency Administration (3)**

Students in this course will assess the skills needed to manage and lead individuals and groups within criminal justice

organizations. By studying management philosophies, leadership theories, organizational culture, and organizational behavior, and human resources, students in this course will learn how to be leaders in the criminal justice field. Additionally, students will explore the history and evolution of organizational management within the criminal justice field. Prerequisite: Junior standing or permission of instructor

Prerequisite: Junior standing or permission of instructor.

**CRJ 433 - Criminal Justice Capstone Demonstration (3)**

This capstone course will provide students the opportunity to integrate and synthesize previous coursework and best practices to complete a research project. Students will demonstrate content-specific mastery through an in-depth case-study analysis. Prerequisite: Senior standing

Prerequisite: Senior standing.

**CRJ 453 - Topics in Criminal Justice (3)**

Selected topics in the area of criminal justice. May be taken multiple times. Prerequisite: Junior standing or permission of instructor

Prerequisite: Junior standing or permission of instructor.

**CRJ 473 - Criminal Justice Internship (3)**

In this course, students will complete observation of and participation in a field-related experience under the direction of an agency supervisor. Students must complete 120 internship hours throughout this course. This course may be taken twice for credit.

Prerequisite: Junior or senior standing and department approval.

**CRJ 4015 - Basic Police Training Course (15)**

Attendance and completion of the Basic Police Training Course at the Indiana Law Enforcement Academy. Prerequisite: Junior or senior standing and department approval

Prerequisite: Junior or senior standing and department approval.

**CRJ 502 - The American System of Justice (2)**

An examination of the core components of the criminal justice system: courts, law enforcement, and correctional agencies. Particular emphasis will be placed on the interrelationship between the various components as they attempt to meet their individual mandates. Prerequisite: Must be admitted to either the MSCJ or Certificate Program

Prerequisite: Must be admitted to either the MSCJ or Certificate Program.

**CRJ 503 - Seminar Law & Social Control (3)**

This course provides students with an introduction to legal theory and the moral, practical and legal implications of law as a means of maintaining social order. The course also examines the impact of economic and political forces on social control.

**CRJ 513 - Criminology (3)**

Throughout this course students will examine criminological theories. Students will research the nature, extent, cause, and control of criminal behavior. Additionally, students in this course will assess the ways in which crime is measured, by analyzing various crime typologies.

Prerequisite: None.

**CRJ 533 - Criminal Justice Policy Formation & Analysis (3)**

A study of the methodology behind law, statute, and policy creation in the public criminal justice arena. Includes a discussion

of the American political system and an evaluation of key public policies that impact the justice system. Prerequisite: Must be admitted to either the MSCJ or Certificate Program

Prerequisite: Must be admitted to either the MSCJ or Certificate Program.

**CRJ 543 - Criminal Justice Research & Writing (3)**

This course prepares students for academic writing at the graduate level. Throughout this course, learners will use research and critical thinking skills to develop original thoughts. Exploration and research for the criminal justice capstone will also begin in this course.

**CRJ 553 - Applied Statistics for Criminal Justice (3)**

This course will examine the study of data analysis as it relates to the social sciences. Topics will include inductive and descriptive analysis, sampling, and methods of evaluation. The emphasis will be on practical application of statistics to criminal justice situations.

**CRJ 563 - Planning & Program Evaluation (3)**

An overview of program planning and intervention principles for the public administrator. Students will review methodologies for identifying public issues, planning for them, and assessing outcomes. Attention will also be given governmental policies as they impact program planning. Prerequisite: ENG 501 and must be admitted to either the MSCJ or Certificate Program

Prerequisite: ENG 501 and must be admitted to either the MSCJ or Certificate Program.

**CRJ 593 - Criminal Justice Capstone Preparation (3)**

An in-depth application of the concepts contained in the core courses. Under the direction of a criminal justice faculty member, the student will design, research, and evaluation of the criminal justice capstone program or policy. This will include identifying criminal justice issues, evaluating and planning for solutions. The students will then formally present to a committee of at least two full-time or adjunct professors.

**CRJ 643 - Law & Public Policy (3)**

This course provides an overview of several key legal issues faced by administrators within criminal justice public agencies. It focuses on statutory and Constitutional public employment rights and the Constitutional limitations on these administrators' interactions with prisoners, probationers and parolees. It also addresses core issues faced by public managers in the field of administrative law. Prerequisite: Must be admitted to either the MSCJ or Certificate Program

Prerequisite: Must be admitted to either the MSCJ or Certificate Program.

**CRJ 653 - Crisis Intervention for Law Enforcement (3)**

This course prepares students to identify, intervene and deescalate crisis situations in various criminal justice fields. Upon completion of this course, students should be able to recognize crisis situations and provide short-term assistance to emergency situations minimizing long-term distress. Students will also be able to identify mental illnesses and provide information on resources promoting mental health services.

**CRJ 663 - Child Welfare and The Family (3)**

This course will provide students with an overview of the child welfare system in relation to the field of criminal justice. Students will review and evaluate laws, policies, procedures and practices of child welfare and family. Upon completion of this course, students will be able to assess risk factors related to child welfare and identify preventative measures. Students will also be able to learn strategies to engage parents and families in child welfare services.

**CRJ 683 - Criminal Justice Demonstration Capstone (3)**

An in-depth analysis and synthesis of the concepts contained within the program courses. Conducted under the direction of a criminal justice faculty member, the student will chose an area in the criminal justice system that needs change and research, design and implement a capstone project that is a comprehensive solution. The student will present the results to a committee of

two full time or adjunct professors who specialize in criminal justice. Prerequisites: CRJ 593

Prerequisite: CRJ 593.

# CS-Computer Science

**CS 1113 - Introduction to Object-Oriented Program (3)**

Basic object-oriented programming concepts are covered, such as: control structures, data structures, classes, primitive data types and expressions. Other topics include IDE, API, and debugging techniques.

Prerequisite: none. Corequisite: MA 113 or higher.

**CS 1123 - C++ & Object Oriented Design (3)**

This course covers the C++ programming language including ideas from object-oriented design. Students will: use pointers and arrays; use header files; overload operators; use functions of the standard library; determine a plan for testing a piece of software; organize a program to determine classes and objects; design a graphical user interface using a GUI tool kit. Prerequisite: CS 1113 with a grade of "C" or above

Prerequisite: CS 1113 with a grade of "C" or above.

**CS 1123 - C++ & Object Oriented Design (3)**

This course covers the C++ programming language with emphasis placed on object-oriented design. Students will: use pointers and arrays; use header files; overload operators; use functions of the standard library; determine a plan for testing a piece of software; organize a program to determine classes and objects; design a graphical user interface using Qt GUI Prerequisite: CS 1113 with a grade of "C" or above

Prerequisite: CS 1113 with a grade of "C" or above.

**CS 2103 - Algorithm Design & Analysis (3)**

The theory of programming, reinforced with practical activities. Students will: analyze algorithms for asymptotic required memory and time; implement stacks, queues, dictionaries, priority queues using arrays and linked lists; apply recursion, backtracking, and dynamic programming; use classic strategies like greedy search and branch-and-bound; use trees and graphs to solve problems; explain theory of computation (automata and Turing machines); explain complexity classes like P and NP. Prerequisite: CS 1123

Prerequisite: CS 1123.

**CS 2103 - Algorithm Design & Analysis (3)**

The theory of programming, reinforced with practical activities. Students will: analyze algorithms for asymptotic required memory and time; implement stacks, queues, dictionaries, priority queues using arrays and linked lists; apply recursion, backtracking, and dynamic programming; use classic strategies like greedy search and branch-and-bound; use trees and graphs to solve problems; explain theory of computation (automata and Turing machines); explain complexity classes like P and NP. Prerequisite: CS 1123

Prerequisite: CS 1123.

**CS 2213 - Operating Systems (3)**

Students learn the concepts and vocabulary of operating system software that manages processes, memory, device drivers, and a user interface, including secondary storage and network access. The successful students will be able to: identify and explain the software concepts that provide the standard abstractions upon which developers rely; design, implement, modify, and

analyze the responsibilities of these complex software systems; explain the vulnerabilities produced by poorly designed security; compare analytically current operating systems, addressing the solutions chosen in different systems and explaining the tradeoffs made. Prerequisites: CS 1123

Prerequisite: CS 1123.

**CS 2213 - Operating Systems (3)**

Students learn the concepts and vocabulary of operating system software that manages processes, memory, device drivers, and a user interface, including secondary storage and network access. The successful students will be able to: identify and explain the software concepts that provide the standard abstractions upon which developers rely; design, implement, modify, and analyze the responsibilities of these complex software systems; explain the vulnerabilities produced by poorly designed security; compare analytically current operating systems, addressing the solutions chosen in different systems and explaining the tradeoffs made. Prerequisites: CS 1123 and SE 233

Prerequisite: CS 1123 and SE 233.

**CS 2503 - Software Engineering (3)**

Is an introduction to software engineering form requirements definitions, through system modeling, specification and design, to verification and validation. Students will: explain project management issues including software cost estimation; determine applicable SDLC models; explain Agile methods (XP and Scrum); gather requirements; design architecture of a software system; create tests to assure quality of software; design and implement an effective graphical user interface. (Same as SE 353) Prerequisite: CS 1123

Prerequisite: CS 1123. Crosslisted as: SE 353.

**CS 2613 - Artificial Intelligence & Information (3)**

This course introduces the basic terms and issues of artificial intelligence. It describes knowledge representation and search methods, and learning systems like genetic algorithms and neural networks. The course describes information models and systems, database systems data modeling, and both relational databases and query languages. Prerequisites: CS 1123

Prerequisite: CS 1123.

**CS 3223 - Network Architecture (3)**

Topics include distributed algorithms interfacing and communication; multiprocessing architectures; LAN, WAN and ISO/OSI; concurrency; scheduling; real-time issues; fault-tolerance; system performance measurement; scripting. Prerequisites: CS 2213

Prerequisite: CS 2213.

**CS 3613 - Machine Learning and Artificial Intelligence (3)**

An introduction to AI with a strong emphasis on machine learning (ML). The successful student will: apply modern AI frameworks like Keras and Scikit Learn, and will be able to describe and use tools like Jupyter notebooks and/or cloud computing for training AIs; attack learning problems using decision trees & forests for expert systems, deep, convolutional and/or feedback artificial neural networks for supervised learning (including natural language), clustering and/or other unsupervised learning techniques; Apply search techniques (tree and gradient) to reasoning and/or optimization problems.; Reflect on learning from data as an IT, IP, and ethical problem, among other ethical and cultural issues around AI; Demonstrate a better-than-popular-press understanding of Large Language Models, including word embeddings. Prerequisite: CS 1113 and MA 134

Prerequisite: CS 1113 and MA 134.

**CS 3613 - Artificial Intelligence (3)**

Introduction to Software AI and machine learning. Students will analyze problems and develop programs showing mastery of knowledge representation, expert systems and formal reasoning; heuristic searches; adaption; pattern classification/recognition, and learning. They will be ready to explain genetic algorithm development, supervised and unsupervised learning, and Bayesian learning. Prerequisite: CS 1113 and MA 134

Prerequisite: CS 1113 and MA 134.

**CS 4023 - Programming Language Design (3)**

An introduction to the diversity of programming paradigms, and a deeper look at the core concepts of compilers. Students will develop working code in several language paradigms, including a functional language; discuss symbols, types, lexical, dynamic, and static scopes, storage duration, and namespace; read syntax grammar; explain and exploit continuation and closure; critique the choice of a paradigm (Object-oriented, functional, procedural, data, logic) for an application. It's helpful to have project experience before this course. Prerequisites: CS 1123

Prerequisite: CS 1123.

**CS 4033 - Special Topics (3)**

Addresses advanced topics that vary by year. Prerequisite: Consent of instructor

Prerequisite: Consent of instructor.

**CS 4103 - Advanced Software Development (3)**

Tools and techniques required to develop complex applications using contemporary software development methods. Students will: develop apps for Android smartphones and tablets; develop software-as-a-service applications; use cloud computing technologies; integrate a database in applications; use test-driven development methods. Prerequisite: CS 1123

Prerequisite: CS 1123.

**CS 4103 - Advanced Software Development (3)**

Tools and techniques required to develop complex applications using contemporary software development methods. Students will: develop apps for Android smartphones and tablets; develop software-as-a-service applications; use cloud computing technologies; integrate a database in applications; use Agile and test-driven development methods.  Prerequisite: CS 1123 with a grade of "C" or above

Prerequisite: CS 1123 with a grade of "C" or above.

# CSIT-Computer Sci Information Tech

**CSIT 101 - Introduction to Computer Science & Information Technology (1)**

This course offers resources for success in learning for students new to Trine University. This course will assist students in becoming more proficient learners, understanding self and others, and learning personal life skills. This course will present information about Trine University offices and services to familiarize students with resources and procedures.

Prerequisite: none. Corequisite: none.

**CSIT 103 - Introduction to Information Systems (3)**

Emphasis is on history, terminology, principles, solutions and use of computers in business.  Software applications will also be explored.

**CSIT 123 - Computing Infrastructure Basics (3)**

Fundamentals of supporting an integrated technical architecture. Topics include: operating systems, local network, and network infrastructure. Mobile devices, printers, virtualization, and cloud computing are also covered. Students will learn to troubleshoot various components of the IT infrastructure and become familiar with critical IT support tasks. This course maps fully to CompTIA's latest A+ 220-1001 (Core 1) Exam objectives.

**CSIT 153 - Introduction to Operating Systems (3)**

This course is an introduction to computer operating systems, including their organization and functions of hardware components. Emphasis on system commands, operating system interface, system utilities, shell programming, file systems, and security. Concepts, such as, the graphical user interface, device drivers, memory management, processes, concurrency, scheduling, multitasking and multiprocessing will be covered. Labs include the installation, management, troubleshooting, and administration of Microsoft Windows and Linux-based operating systems.

**CSIT 163 - Using Programming to Solve Problems (3)**

This course is an introduction to the fundamental concepts and techniques of computer programming. Students will learn to translate a real problem into a program description, and write and test a program to implement their description. The emphasis will be on developing a professional style using correct syntax; modular design; definition of data types; sequence, selection, and repetition control structures; arrays; classes; and simple file input/output (I/O).

**CSIT 1013 - Esports Administration (3)**

Students will explore the world of esports through an administration perspective. Focus will be placed on the formation, structure, maintenance, and coaching of esports organizations at the amateur, collegiate and professional levels. Entrepreneurship in the gaming industry will be studied.

**CSIT 1023 - The History of Gaming (3)**

This course is designed to educate students about the history of video games, gaming and esports. This will focus specifically on the development of what video games started as, and what they have evolved into. This will include not only the history of the games, themselves, but the companies, creators, and culture that helped to create the industry as it currently exists. This course will cover the history of the video game from the 1950s to the modern day industry.

**CSIT 203 - Web Site Design (3)**

This course focuses on web technologies, web-based systems, and web page design. Topics covered include Internet applications, web site development, multimedia technologies, vulnerabilities, web site publishing, and web site maintenance.

**CSIT 223 - Network Management (3)**

This course is an introduction to technologies, terminology, and skills used in the world of data networking. Emphasis is on practical applications of networking and computer technology to real-world problems. Prepares students for entry-level job as a networking technician and prepares them for learning more advanced topics in networking. Students will be introduced to topics covering the CompTIA Network+ and Cisco CCNA Professional certification exams.

Prerequisite: none.

**CSIT 233 - Designing Data Links to Web Applications (3)**

This course focuses on web page construction, client and server-side scripting, database interaction, file systems, performance issues, and security concerns of web applications. Prerequisites: CSIT 203 and INF 403

Prerequisite: CSIT 203 and INF 403.

**CSIT 243 - Mobile Application Development (3)**

This course covers mobile application development frameworks; architecture, design and engineering issues, techniques, methodologies for mobile application development. Students will be required to implement a mobile application on two

separate platforms. Prerequisites: CSIT 163 and CS 1113

Prerequisite: CSIT 163 and CS 1113.

**CSIT 253 - Artificial Intelligence & Information (3)**

An introduction to the field of artificial intelligence: LISP language, search techniques, games, vision, representation of knowledge, inference and process of proving theorems, and natural language understanding. Prerequisite: CSIT 163

Prerequisite: CSIT 163.

**CSIT 273 - Enterprise Architecture (3)**

Throughout this course, students will examine the foundational aspects of both enterprise and architectural thinking, including the software to technology to solution architecture continuum. Additionally, students will assess the role of enterprise architecture in business and IT alignment, architectural styles, and techniques for capturing and documenting architectures. Students will also learn techniques for analyzing and reasoning about architectures.

Prerequisite: none.

**CSIT 2013 - Esports Analytics (3)**

This course focuses on the evaluation and interpretation of games and game footage to analyze matches, teams, players and the meta game of esports. It will focus on how to interpret data between games, how to build teams for competitive leagues, and how to break down matches of current professional games. It will explore the different games, and different types of statistics between games analysts should focus upon.

Prerequisite: none. Corequisite: none.

**CSIT 2023 - Linux and PowerShell (3)**

An introduction to Linux and PowerShell focusing on servers and pen-testing. Students will perform basic administration of a Linux based system, including PowerShell scripting, command line usage, process control, user management, software installation and software removal. Additionally, students gain fluency in the structure of the operating system, bootup process, and kernel structure.

Prerequisite: none. Corequisite: none. Crosslisted as: none.

**CSIT 2033 - Programming for Cybersecurity (3)**

This course is designed to ensure that students gain the necessary skills and knowledge to understand and apply programming concepts in the context of cybersecurity. Students will learn programming skills but also understand how to apply them in the specific context of cybersecurity. This knowledge is essential for building and maintaining secure software and systems, as well as for identifying and mitigating security threats effectively. Prerequisite: CSIT 163

Prerequisite: CSIT 163.

**CSIT 2043 - Intro to Cloud Computing and Security (3)**

This course will teach students the basics of cloud computing. Students will gain hands-on experience working with cloud infrastructure and networking, cloud administration, cloud computing platforms, virtualization, and container management. Students will also gain an understanding of cloud applications and infrastructure, as well as how to secure, defend, attack, and audit cloud environments.

**CSIT 2053 - Cybersecurity Law (3)**

This course will act as an introduction to the laws that are applicable to cybersecurity. Students will learn topics relating to cybersecurity, cyber law, criminal justice, cybercrime, technological law, and court proceedings.

**CSIT 333 - Introduction to E-Commerce Site Development (3)**

This course introduces the concepts and technologies used in electronic commerce. The course content includes the need for e-commerce, the technological challenges, the legal and regulatory framework, technological challenges, organization and business barriers, and strategies for creating a successful e-commerce site. Prerequisite: CSIT 233

Prerequisite: CSIT 233.

**CSIT 363 - Certified Ethical Hacking I (3)**

Using methodologies and frameworks from the field, students will be introduced to ethical hacking throughout this course. Students will review the basics of information security including international and national laws. Additionally, concepts of reconnaissance, footprinting, enumeration of information systems, and vulnerability analysis will be covered. Prerequisite: CSIT 223 and INF 343 Corequisite: CSIT 373

Prerequisite: CSIT 223 and INF 343. Corequisite: CSIT 373.

**CSIT 373 - Certified Ethical Hacking II (3)**

Throughout this course, basic hacking techniques will be explored through a hands-on lab. Through simulations, students will engage in hacking beginner level environments. Students will explore malware, network sniffing, social engineering, and denial of service concepts. Additionally, students will learn how to gain access, use privilege escalation, maintain access, and clear tracks. Professional report writing will also be covered.

Corequisite: CSIT 363

Corequisite: CSIT 363.

**CSIT 383 - Certified Ethical Hacking III (3)**

Throughout this course, students will engage in hacking intermediate level environments. Additionally, students will explore web application/server, SQL injection, IDS/IPS/honeypots, and session hijacking concepts. Students will continue to refine professional report writing. Prerequisites: CSIT 373 and INF 403 Corequisite: CSIT 393

Prerequisite: CSIT 373 and INF 403. Corequisite: CSIT 393.

**CSIT 393 - Certified Ethical Hacking IV (3)**

Throughout this course, students will engage in hands-on lab simulations and hack advanced level environments. Additionally, students will explore wireless/mobile attack vectors, IoT, cloud computing, and cryptography concepts. Students will write professional reports in this course. Corequisite: CSIT 383

Corequisite: CSIT 383.

**CSIT 3013 - Introduction to Gameplay Creation (3)**

Students will learn how to create new gameplay for video games. Specifically, they will learn how to convert their ideas into an effective formal design document. Students will also be introduced to the challenge and reward loop, as well as pacing and planning game experiences. In addition, students will learn how to design a complete user interface for any video game.

Prerequisite: None.

**CSIT 3023 - Level, Character, and Story Building (3)**

Students will learn how to create content for video games. They will be introduced to effective level design, character development, and storyboard planning. Students will also learn about writing dialogue, creating non-player characters (NPCs), quest generation, puzzles, conflict with resolution, and linear vs. non-linear progression.

Prerequisite: None.

**CSIT 3033 - Malware Analysis and Digital Forensics (3)**

In this course, students will learn about the composition and exploitation of malware, as well as enterprise incident response processes. Topics include malware identification, vulnerability analysis, malware analysis tools, incident response and incident response planning. This course will also teach students the basics of digital forensic research. Students will gain hands on experience with digital forensic technology and gain an understanding of topics such as evidence analysis, digital forensic investigation, digital evidence handling, and digital crime. Prerequisite: CSIT 2033

Prerequisite: CSIT 2033.

**CSIT 3043 - Advanced Server Administration (3)**

This course provides students with exposure to enterprise windows server administration. Students will gain an advanced understanding of user management, group policy, active directory, PowerShell, and Windows administration.

**CSIT 3111 - Internship (1)**

This course involves meaningful work experience related to the student's field of study or other functional areas of Information Technology at an approved company. The assignment must be approved by both the student's advisor and the Department Chair. A maximum of 3 credit hours may be granted for any one work session. Prerequisite: CSIT major, and permission of the Department Chair

Prerequisite: CSIT major, and permission of the Department Chair.

**CSIT 3112 - Internship (2)**

This course involves meaningful work experience related to the student's field of study or other functional areas of Information Technology at an approved company. The assignment must be approved by both the student's advisor and the Department Chair. A maximum of 3 credit hours may be granted for any one work session. Prerequisite: CSIT major, and permission of the Department Chair

Prerequisite: CSIT major, and permission of the Department Chair.

**CSIT 3113 - Internship (3)**

This course involves meaningful work experience related to the student's field of study or other functional areas of Information Technology at an approved company. The assignment must be approved by both the student's advisor and the Department Chair. A maximum of 3 credit hours may be granted for any one work session. Prerequisite: CSIT major, and permission of the Department Chair

Prerequisite: CSIT major, and permission of the Department Chair.

**CSIT 403 - Applications of Cybersecurity (3)**

This course provides a comprehensive review of information systems security concepts and industry best practices, covering the first four of eight domains of the CISSP Common Body of Knowledge (CBK®). This course is designed for information security future and current professionals, providing students with deep technical and managerial knowledge. Throughout this course, students learn how to effectively design, engineer, and manage the overall security posture of an organization. Prerequisite: CSIT 393

Prerequisite: CSIT 393.

**CSIT 443 - Advanced Cybersecurity Concepts (3)**

This course examines the analysis, design, implementation, and management issues surrounding effective concepts of cybersecurity. Virus protection and conceptual and technological aspects of data security for computer and networks will be examined including firewalls, authentication, encryption, wireless security, security protocols, security policy development, digital forensics, and fraud protection. Prerequisites: CSIT 403

Prerequisite: CSIT 403.

**CSIT 483 - Senior Capstone I (3)**

Capstone design projects selected from a wide variety of areas related to Computer Science and Information Technology. Develops system approach to design: preparation of specifications, scheduling, modeling, simulations, and technological, financial and environmental aspects. Multi-disciplinary teamwork is emphasized. Prototyping, testing and completion of the project are required. Presentation of results required. Prerequisite: Senior Standing

Prerequisite: Senior Standing.

**CSIT 493 - Senior Capstone II (3)**

Multi-disciplinary team experience in engineering design, emphasizing realistic constraints such as safety, economic factors, reliability, aesthetics, ethics and societal impact. Projects will be supervised by Computer Science and Information Technology faculty. Prerequisite: CSIT 483

Prerequisite: CSIT 483.

**CSIT 4013 - Game Design and Development (3)**

This course is designed to teach students to become skilled in coding, game design, and 3D modeling using game design software. This course ends with the learners creating a completely original game of their own design from the initial concept up to the first playable prototype.

Prerequisite: CSIT 163.

**CSIT 4023 - Video Game Testing and Quality Assurance (3)**

Students will learn the mechanics of playtesting and game balancing in single and multiplayer games. In addition, they will be introduced to formal documentation and reporting techniques, alpha and beta testing, patching, debugging, meta analysis, and game updates.

Prerequisite: CSIT 163 and Junior Standing.

**CSIT 4033 - Virtual Reality Game Production (3)**

Students will learn how to create virtual reality games. They will be introduced to making and loading worlds, user interfaces, accepting user input, and building other user experiences. In addition, students will explore the iterative design process and how to improve a VR game based on user feedback. Prerequisites: CSIT 163 and Junior standing

Prerequisite: CSIT 163 and Junior Standing.

# DEI-Diversity, Equity, and Inclusion

**DEI 243 - Organizational Emotional Intelligence (3)**

Throughout this course, students will use the four quadrants of emotional intelligence to recognize and positively manage emotions of self and others. Students will learn how to use open communication and authentic collaboration to build trust within organizations. Additionally, students will learn the importance of ethics and accountability as it relates to organizational emotional intelligence.

Prerequisite: None. Corequisite: None.

**DEI 333 - Recognizing & Mitigating Unconscious Biases (3)**

This course prepares students to recognize and mitigate unconscious biases within the organizations they serve. Students will acknowledge their unconscious beliefs, judgements, and false perceptions of others. Students will also examine the stereotypes and prejudices that exist within organizational cultures and how to overcome these assumptions when making decisions.

Additionally, students will identify how to foster impartiality and objectivity in organizations. Prerequisites: DEI 243 or COM 163

Prerequisite: DEI 243 or COM 163. Corequisite: None.

**DEI 413 - Creating a Diverse & Inclusive Organizational Culture (3)**

Students in this course will learn organizational best practices to implement diversity, equity, inclusion, and belonging in the workplace. Students will evaluate laws and policies that apply to diversity and inclusion. Students will also build cultural competencies to foster employee recruitment, motivation, satisfaction, and retention. Additionally, students will analyze the leadership skills and processes needed to develop an organizational culture that is diverse and inclusive. Prerequisite: DEI 243 or COM 163

Prerequisite: DEI 243 or COM 163. Corequisite: None.

# DIT-Doctorate of Information Technology

**DIT 7003 - Network Management (3)**

Throughout this course, students will explore the information systems infrastructure. This course will focus on data communications and networks. Students will examine layered network architectures, communication hardware, and protocols associated with networking. Emerging technologies such as mobility, cloud computing, Big Data, tools for data analytics, and artificial intelligence (AI) will also be covered. (same as IS 5203)

Crosslisted as: IS 5203.

**DIT 7013 - Cybersecurity (3)**

This course provides knowledge and practical skills required for a variety of cybersecurity roles. Throughout this course, students will use technologies and tools to identify and address security threats, attacks, and vulnerabilities. Emphasis is placed on the latest trends and techniques in risk management, risk mitigation, threat management, and intrusion detection. This course also covers principles and foundations of network architecture and design, cryptography, and PKI. Prerequisite: IS 5203 or DIT 7003

Prerequisite: DIT 7003 Network Management/IS 5203 Network Management. Crosslisted as: IS 5403 Cybersecurity.

**DIT 7023 - Data Science and Big Data (3)**

Throughout this course, students will learn the field of Data Science through the use of data analytics tools. Concepts of Big Data and how it enhances the decision-making process used by businesses in today's industry will be covered in this course. Students will utilize data analysis tools to decipher the abundance of information in Big Data. Students will work with open-source software to discover the benefits of Big Data as it pertains to industry. (same as IS 5213)

Crosslisted as: IS 5213.

**DIT 7033 - Analytics Software and Tools (3)**

In this course, learners will apply software analytics using data analytical tools and techniques to industry related cases. Through practical case studies and illustrations students will extract information from different data types utilizing business analytics, including: advanced spreadsheets, SQL queries, statistical analysis tools, and purpose programming language.

Crosslisted as: BAN 5013.

**DIT 7043 - IT for Management (3)**

This course will provide in-depth information on the topic of information technology to help learners achieve active roles in the management of information technology. Learners will analyze corporate strategies to effectively implement information

technology in a business environment. Throughout this course, learners will evaluate the advantages of electronic communication, the automation of production, the virtual components of information technology, and the tools needed to create a flat organization. Learners will investigate emerging technology concerns that management needs to compete within the global marketplace. Additionally, this course will present the technology evolution process of creating a structure that will transform an organization's competitive advantage.

**DIT 7053 - IT Procurement Processes (3)**

Throughout this course, learners will assess the processes and procedures used to procure information technology. Learners will examine the procurement process as it pertains to physical infrastructures, software components, and network environments of organizations. Learners will also evaluate how the emerging technology market impacts a business's competitive advantage. Learners will analyze procurement of IT infrastructure processes to manage the organization's business continuity plan. Additionally, learners will investigate the benefits of a diverse supplier base, profitability, security, and strategies of an organization, as they pertain to physical and next generation technologies.

**DIT 7063 - IT Project Management (3)**

Throughout this course, learners will assess the tools needed in planning, communicating, implementing, and delivering projects on schedule. Learners will study the concepts of risk management and management of personnel. Additionally, learners will investigate the pillars and principles of project management in industry and how they influence organizational operations. Learners will recommend in-house or outsourcing of project management for specific projects. Learners will also compare software-based project management tools that are common in industry.

**DIT 7073 - Innovations in IT (3)**

Throughout this course, learners will analyze how digital innovations in information technology (IT) influence business performance. Learners will examine how digital innovations effect the business world, including the nature of business, business processes, and business outcomes. Learners will also evaluate the short and long-term consequences of digital innovations on social, economic, and cultural aspects of business. Additionally, learners will research how digital innovations support operations through performance improvement.

**DIT 7083 - Computer Science with Python (3)**

In this course, learners will examine computer programming and advanced features of Python. Learners will develop skills in logical thinking and problem-solving while utilizing computer programming. Learners will also evaluate the theoretical limitations of problem-solving using Python. This course focuses on why Python is used in many scientific approaches for the exploration of data. Learners will compare the different features of Python needed to conduct analysis of a program's performance.

**DIT 7093 - Discrete Mathematics for IT (3)**

In this course, learners will examine particular sets of mathematical facts and explore how to think both mathematically and logically. Learners will test different methods of problem-solving using mathematical reasoning. This course incorporates concepts of mathematical reasoning, combinational analysis, discrete structures, algorithmic thinking, and application and modeling. Learners will use mathematical reasoning for reading, comprehension, and developing mathematical arguments.

**DIT 9006 - DIT Research Proposal Preparation (6)**

In this course, learners will refine their research skills through writing and critiquing research proposals. Learners will define their research proposal by providing milestones for the proposal process. The learner's milestones will be validated through meetings with the research advisor in which the learner will receive feedback on their progress, content, and the overall proposal. Learners will present effective objectives, hypothesis, research questions, literature reviews, and proposed strategies for analyzing information. Additionally, learners will complete the required documentation, including their research plan, progress reports, and research questions.

**DIT 9016 - DIT Applied Research Project I (6)**

In this course, learners will present the theoretical framework of their chosen area of study. Learners will determine key

research questions within the demography in which they are conducting their independent research. Learners will apply research training and mastered program learning outcomes by designing the appropriate strategies and methodologies to carry out research. Additionally, learners will perform independent research in the area of study and will present analysis in written format, including report results and conclusions with scholarly references. Prerequisite: DIT 9006

Prerequisite: DIT 9006.

**DIT 9026 - DIT Applied Research Project II (6)**

In this course, learners will construct the theoretical framework of their chosen area of study. Learners will expand on the research questions within the demography in which they are conducting their independent research. Learners will implement program learning outcomes by constructing the appropriate strategies and methodologies to carry out research. Additionally, learners will continue the independent research process in the area of study and will present an analysis in written format including report results and conclusions with scholarly references. Prerequisite: DIT 9016

Prerequisite: DIT 9016.

# DPT-Doctor of Physical Therapy

**DPT 5001 - Graduate Independent Study (1)**

This course is to be used when approved by Program Director, in rare circumstances for a student to earn either 1, 2 or 3 credits for an independent study of the subject matter in the program.

**DPT 5002 - Graduate Independent Study (2)**

This course is to be used when approved by Program Director, in rare circumstances for a student to earn either 1, 2 or 3 credits for an independent study of the subject matter in the program.

**DPT 5003 - Graduate Independent Study (3)**

This course is to be used when approved by Program Director, in rare circumstances for a student to earn either 1, 2 or 3 credits for an independent study of the subject matter in the program.

**DPT 5024 - Foundations of Medical Anatomy (4)**

Students will increase their knowledge of the primary developmental patterns and structural composition of the human form. In addition to an increase in their anatomical knowledge, students will learn to correlate anatomical form with clinical manifestations of dysfunction of the primary body systems such as, but not limited to, the musculoskeletal, cardiovascular, respiratory, and nervous systems. Genetic, molecular, histological, and embryological disorders which manifest themselves as anatomical dysfunction will also be discussed within the context of the course. While the course is designed to be an EXTENSION of material from an undergraduate anatomy course, this course would satisfy the pre-requisite anatomy requirement for the DPT program. Prerequisite: Accepted into the Doctorate of Physical Therapy program.

Prerequisite: Accepted into the Doctorate of Physical Therapy program.

**DPT 5034 - Foundations of Medical Physiology (4)**

This course will include detailed study of the physiology of the neuromuscular, cardiovascular, respiratory, renal, endocrine, and gastrointestinal systems. Emphasis is placed on medical aspects of human physiology and how these conditions manifest themselves within the patient presentation of human disease. Students will use interactive computer modeling to simulate clinical scenarios and analyze normal and pathophysiological responses. The course, while designed to be an extension of knowledge from an undergraduate human physiology course for preparation for graduate level study, would meet pre-requisite requirements for physiology for graduate school application criteria. Prerequisite: Accepted into the Doctorate of Physical Therapy program.

Prerequisite: Accepted into the Doctorate of Physical Therapy program.

**DPT 5111 - CARE I (1)**

Clinical Application and Reflection Experience (CARE) I is the first in a series of five courses that are integrated with didactic instruction in the first five semesters of the DPT curriculum. Students work in teams with a physical therapist clinical instructor to practice and refine skills, employ clinical problem-solving, participate in reflective group discussions and assume professional roles in various clinical patient care settings. Students are expected to demonstrate skills and apply knowledge obtained from concurrent coursework. Prerequisite: Accepted into the Doctorate of Physical Therapy program.

Prerequisite: Accepted into the Doctorate of Physical Therapy program. Corequisite: None. Crosslisted as: None.

**DPT 5124 - Anatomy of Movement I (4)**

Systems and regional approaches to gross human anatomy are combined with principles of kinesiology to enable an in-depth study of the anatomical components and principles of function. The material covered in this course includes anatomy and kinesiology of the upper extremities, head, and neck. Classroom and online lectures are complemented by laboratory experiences that include study of prosected human cadavers, and instructional palpation of live humans. Prerequisite: Accepted into the Doctorate of Physical Therapy program.

Prerequisite: Accepted into the Doctorate of Physical Therapy program. Corequisite: none. Crosslisted as: none.

**DPT 5134 - Applied Physiology I (4)**

This is the first of a two course series in which students study applied physiological concepts. This course focuses on the physiological and functional responses and adaptations of the human body to exercise, and the influences of structural and physiological changes with growth, aging, nutrition, drugs, and disease. The primary focus will be on the musculoskeletal and cardiopulmonary systems, and systems of energy production, delivery and balance. Learning occurs through lecture, discussion, and laboratory experiences. Prerequisite: Enrolled in the Doctor of Physical Therapy program

Prerequisite: Enrolled in the Doctor of Physical Therapy program.

**DPT 5143 - Clinical Practice I (3)**

Students learn through lecture, discussion, and guided practice important skills for patient management in clinical practice. Examples of these skills include: Effective patient interviewing and documentation; assessment of impairments including vital signs, sensation, reflexes, and pain; safe and effective positioning and draping; managing wheelchairs and other equipment; safe assistance with gait and transfers; and the therapeutic application of superficial heat and cold. Students are also introduced to theoretical models that guide clinical decision making, including patient management, clinical reasoning, disablement, and evidence-based practice models. Prerequisite: Enrolled in the Doctor of Physical Therapy program

Prerequisite: Enrolled in the Doctor of Physical Therapy program.

**DPT 5152 - Health Behavior Science (2)**

Students will explore and analyze how human actions, cognitions, communications, culture, and environment affect health, chronic disease, and quality of life across the lifespan. Students will explore evidence and strategies for health promotion through education, behavior modification, policy change, development and implementation of programs, and evaluation of impact and outcomes.

Prerequisite: Enrolled in the Doctor of Physical Therapy program.

**DPT 5162 - Professional Development I (2)**

This is the first professional development course which focuses on the professional socialization process. Students will learn about the profession of physical therapy, including its history, and future directions. Topics of emphasis include professional codes of ethics and conduct, laws relative to PT practice, interprofessional collaborative practice, therapeutic communication, and conflict resolution.

Prerequisite: Enrolled in the Doctor of Physical Therapy program. Corequisite: None. Crosslisted as: None.

**DPT 5211 - CARE II (1)**

Clinical Application and Reflection Experience (CARE) II is the second in a series of five courses that are integrated with didactic instruction in the first five semesters of the DPT curriculum. Students work in teams with a physical therapist clinical instructor to practice and refine skills, employ clinical problem-solving, participate in reflective group discussions and assume professional roles in various clinical patient care settings. Students are expected to demonstrate skills and apply knowledge obtained from concurrent and previous coursework. Prerequisites: Successful completion of all coursework in previous semesters

Prerequisite: Successful completion of all coursework in previous semesters.

**DPT 5224 - Anatomy of Movement II (4)**

Systems and regional approaches to gross human anatomy are combined with principles of kinesiology to enable an in-depth study of the anatomical components and principles of function. The material covered in this course includes anatomy of the internal thorax and abdomen as well anatomy and kinesiology of the pelvis and lower extremities. A study of the anatomy of the heart and lungs is also included. Classroom and online lectures are complemented by laboratory experiences that include study of prosected human cadavers, and instructional palpation of live humans. Prerequisites: Successful completion of all coursework in previous semesters

Prerequisite: Successful completion of all coursework in previous semesters. Corequisite: None. Crosslisted as: None.

**DPT 5234 - Applied Physiology II (4)**

This is the second of a two course series in which students study applied physiological concepts. This course focuses on the normal physiology of the cardiovascular, pulmonary, endocrine, GI, renal, and reproductive organ systems, as well the influences of physiological changes with growth, aging, nutrition, drugs, and disease. The course will also highlight the basic processes of disease, identification of tissues displaying signs of disease, and basic diagnostic test and tools. Learning occurs through lecture, discussion, and problem solving laboratory experiences. Prerequisites: Successful completion of all coursework in previous semesters

Prerequisite: Successful completion of all coursework in previous semesters.

**DPT 5241 - Cardiopulmonary PT I (1)**

This course is the first of two that address the physical therapy management of persons with dysfunction of the cardiac and/or pulmonary systems. Students will learn to perform and interpret basic tests and measures of the cardiovascular and pulmonary systems, as a component of a comprehensive physical therapy examination. They will learn to recognize important clinical signs and symptoms of cardiovascular and pulmonary disease, the relevant underlying physiology and pathophysiology, and pharmacologic considerations, and demonstrate an emerging understanding of the implications for clinical decision-making and physical therapy treatments.

Prerequisite: Successful completion of all coursework in previous semesters.

**DPT 5243 - Clinical Practice II (3)**

Students learn through lecture, guided practice, literature reviews, case-based discussion, and documentation assignments, important skills for patient management in clinical practice. Examples of these skills include: assessment of range of motion, muscle performance, and posture: the therapeutic use of passive, active-assisted, and manually resisted motion; and the design and implementation of therapeutic exercise programs. An emphasis is placed on the integration of examination findings, current scientific evidence, and sound clinical reasoning to guide the use of therapeutic exercise for prevention and rehabilitation of movement dysfunction and disability. Prerequisites: Successful completion of all coursework in previous semesters

Prerequisite: Successful completion of all coursework in previous semesters.

**DPT 5254 - Applied Neuroscience (4)**

Students are introduced to the structure and function of the nervous system. An emphasis is placed on the sensory and motor systems involved in motor control and key concepts required for clinical practice. Through lecture and laboratory instruction, the gross and cellular organization of the nervous system are presented, along with its relationship to the somatic and visceral systems, and the reception, transmission, and integration of information at multiple levels. Clinical manifestations of dysfunction of major neural elements are discussed. Prerequisites: Successful completion of all coursework in previous semesters

Prerequisite: Successful completion of all coursework in previous semesters.

**DPT 5311 - CARE III (1)**

Clinical Application and Reflection Experience (CARE) III is the third in a series of five courses that are integrated with didactic instruction in the first five semesters of the DPT curriculum. Students work with a physical therapist clinical instructor to practice and refine skills, employ clinical problem-solving, participate in reflective group discussions and assume professional roles in various clinical patient care settings. Students are expected to demonstrate skills and apply knowledge obtained from concurrent and previous coursework. Prerequisites: Successful completion of all coursework in previous semesters

Prerequisite: Successful completion of all coursework in previous semesters.

**DPT 5343 - Clinical Practice III (3)**

Students learn through lecture, guided practice, literature reviews, case-based discussion and treatment plan development, important skills for patient management in clinical practice. Examples of these skills include: the selection and use of deep thermal, electrodiagnostic, electrotherapeutic, and mechanical/manual techniques including massage and peripheral joint mobilization for various impairments and functional limitations. An emphasis is placed on the integration of examination findings, current scientific evidence, and sound clinical reasoning to guide the use of therapeutic interventions for prevention and rehabilitation of movement dysfunction and disability. Prerequisites: Successful completion of all coursework in previous semesters

Prerequisite: Successful completion of all coursework in previous semesters.

**DPT 5352 - Pharmacology (2)**

An integrated study of pharmacology presenting the pharmacodynamics and pharmacotherapeutics of common classes of drugs which include anti-inflammatory, analgesic, muscle relaxant, psychotropic, anti-microbial, and diabetic medications. Factors emphasized include indications, contraindications, adverse reactions, and the implications for physical therapy care. Prerequisites: Successful completion of all coursework in previous semesters

Prerequisite: Successful completion of all coursework in previous semesters.

**DPT 5361 - Outcome Assessment (1)**

This course explores approaches to the appraisal of health, functional outcomes, and the effectiveness of physical therapy interventions. Students study specific metrics utilized for outcomes assessment, and analyze common health and rehabilitation outcomes measures in terms of reliability, validity, clinical utility, and cost effectiveness. The field of health informatics is introduced with an emphasis on improving the outcomes of physical therapy care. A working knowledge of these topics is developed through lecture, discussion, and case-based examples. Prerequisites: Successful completion of all coursework in previous semesters

Prerequisite: Successful completion of all coursework in previous semesters.

**DPT 5372 - Evidence Based Practice I (2)**

Students will study the theoretical foundations of evidence-based practice and develop a framework to support sound clinical reasoning. They will learn how to search, retrieve and organize scientific evidence from sources of knowledge such as library

and internet-based sources. Following an introduction to psychometrics and principles of measurement in healthcare, students will learn to critically evaluate current literature to inform clinical decisions. Prerequisites: Successful completion of all coursework in previous semesters

Prerequisite: Successful completion of all coursework in previous semesters.

**DPT 5381 - Integumentary System (1)**

This course introduces the physical therapy management of patients with integumentary system pathology or impairments. Study of anatomy, physiology, and pathologies of the integumentary system provide a foundation for theoretical and practical applications of care. Students learn to examine and evaluate individuals with integumentary lesions of various etiologies and to use appropriate clinical decision-making and problem-solving strategies to determine and implement safe and effective plans of care. Prerequisites: Successful completion of all coursework in previous semesters

Prerequisite: Successful completion of all coursework in previous semesters.

**DPT 6111 - CARE IV (1)**

Clinical Application and Reflection Experience (CARE) IV is the fourth in a series of five courses that are integrated with didactic instruction in the first five semesters of the DPT curriculum. Students work in teams with a physical therapist clinical instructor to practice and refine skills, employ clinical problem-solving, participate in reflective group discussions and assume professional roles in various clinical patient care settings. Students are expected to demonstrate skills and apply knowledge obtained from concurrent and previous coursework. Prerequisites: Successful completion of all coursework in previous semesters

Prerequisite: Successful completion of all coursework in previous semesters. Corequisite: None.

**DPT 6124 - Musculoskeletal PT I (4)**

This course is the first of a two-part series dedicated to study of the musculoskeletal system as it relates to the clinical practice of physical therapy. This course introduces students to musculoskeletal examination, evaluation, diagnosis, prognosis, intervention, standardized assessment, and outcome measurement for impairments, functional limitations, and disability in clients with pathologies of the cervical and thoracic spine and upper extremities.

Prerequisite: Successful completion of all coursework in previous semesters. Corequisite: None. Crosslisted as: None.

**DPT 6134 - Neuromuscular PT I (4)**

In this first of a two course series focusing on the neuromuscular system, students will be introduced to the management of adults with complex CNS and multisystem disorders and co-morbidities. Instruction occurs via lecture, discussion of case scenarios, and guided laboratory practice. The neuropathology of conditions frequently managed by physical therapists is studied with an emphasis on examination, evaluation, diagnosis, clinical decision-making, prognosis, intervention, standardized assessments and relevant outcome measures. The appropriate use of assistive technologies is also explored. Prerequisites: Successful completion of all coursework in previous semesters

Prerequisite: Successful completion of all coursework in previous semesters.

**DPT 6142 - Imaging & Laboratory Testing (2)**

Students study the fundamentals of diagnostic testing procedures used in the evaluation of patients with various disorders and disease processes. Scientific principles underlying clinical laboratory testing and imaging technologies will be explained. Emphasis will be placed on the information obtained through specific testing and medical imaging procedures, its sensitivity and specificity, and its potential to influence the physical therapy examination, interventions, and plan of care. Prerequisites: Successful completion of all coursework in previous semesters

Prerequisite: Successful completion of all coursework in previous semesters.

**DPT 6152 - Lifespan: Pediatrics (2)**

Students learn through lecture, discussion, and guided practice, the major components of development from birth through adolescence. Theories that support our understanding of developmental delays and disabilities, and guide clinical decisions are explored. Also considered are pediatric public laws, child abuse, and therapeutic interactions with families. Prerequisites: Successful completion of all coursework in previous semesters

Prerequisite: Successful completion of all coursework in previous semesters. Corequisite: None. Crosslisted as: None.

**DPT 6172 - Evidence Based Practice II (2)**

Students study principles of experimental, qualitative, and survey research methods and the application of these methods to the field of physical therapy. Emphasis is placed on the function of the research question, hypotheses, study design, sampling, study variables, measurement, reliability, validity, and statistics in the analysis and evaluation of research literature. In addition to descriptive statistics, students are introduced to, linear regression, comparison of means, and categorical data analysis (chi-square and logistic regression). Statistics for comparison of results across studies will also be discussed (e.g., effect size, odds ratio). Prerequisites: Successful completion of all coursework in previous semesters

Prerequisite: Successful completion of all coursework in previous semesters.

**DPT 6191 - Anatomy Seminar I (1)**

The goal of this course is to enable an in-depth study of human anatomy. Students will perform an independent human cadaver dissection project under the supervision of the course instructor. Learning is enhanced as students share their results through formal presentations to their peers and clinical experts. Prerequisites: Successful completion of all coursework in previous semesters.

Prerequisite: Successful completion of all coursework in previous semesters.

**DPT 6211 - CARE V (1)**

Clinical Application and Reflection Experience (CARE) V is the last and final course in a series of five that are integrated with didactic instruction in the first five semesters of the DPT curriculum. Students work in teams with a physical therapist clinical instructor to practice and refine skills, employ clinical problem-solving, participate in reflective group discussions and assume professional roles in various clinical patient care settings. Students are expected to demonstrate skills and apply knowledge obtained from concurrent and previous coursework. Prerequisites: Successful completion of all coursework in previous semesters

Prerequisite: Successful completion of all coursework in previous semesters.

**DPT 6224 - Musculoskeletal PT II (4)**

This course is the second part of a two part series dedicated to study of the musculoskeletal system as it relates to the clinical practice of physical therapy. This course introduces students to musculoskeletal examination, evaluation, diagnosis, prognosis, intervention, standardized assessment, and outcome measurement for impairments, functional limitations, and disability in clients with pathologies of the thoracic spine and lower quarter. Prerequisites: Successful completion of all coursework in previous semesters

Prerequisite: Successful completion of all coursework in previous semesters. Corequisite: none. Crosslisted as: none.

**DPT 6233 - Neuromuscular PT II (3)**

In this second of a two course series focusing on the neuromuscular system, students will be introduced to the management of pediatric patients with neurological and neuromuscular conditions and co-morbidities. Instruction occurs via lecture, discussion of case scenarios, and guided laboratory practice. Relevant neuropathology is studied with an emphasis on examination, evaluation, diagnosis, clinical decision-making, prognosis, intervention, standardized assessments and relevant outcome measures. The appropriate use of assistive technologies is also explored. Prerequisites: Successful completion of all coursework in previous semesters

Prerequisite: Successful completion of all coursework in previous semesters.

**DPT 6242 - Cardiopulmonary PT II (2)**

The focus of this course is the physical therapy management of individuals with adults with movement-related cardiovascular and pulmonary conditions including those with significant co-morbidities. Instruction occurs via lecture, discussion of case scenarios, and guided laboratory practice. The pathology of conditions frequently managed by physical therapists is introduced with an emphasis on examination, evaluation, diagnosis, clinical decision-making, prognosis, intervention, standardized assessments and relevant outcome measures. Prerequisites: Successful completion of all coursework in previous semesters

Prerequisite: Successful completion of all coursework in previous semesters.

**DPT 6252 - Lifespan: Geriatrics (2)**

Students study the physiologic and pathologic changes in musculoskeletal, neurological, integumentary, cardiopulmonary and metabolic systems that occur from middle to old age and the consequent effects on physical performance, cognition, behavior, and social and emotional wellbeing. Emphasis will be placed on utilizing a clear understanding of the consequences of aging to plan effective, evidence-based physical therapy intervention for older adults. Prerequisites: Successful completion of all coursework in previous semesters

Prerequisite: Successful completion of all coursework in previous semesters. Corequisite: none. Crosslisted as: none.

**DPT 6272 - Evidence-Based Practice III (2)**

In this course students apply the concepts of evidence-based practice to answer a question relevant to clinical practice. Students work in groups with faculty mentors to identify a question, review the relevant literature, and collect and analyze evidence to determine best practices and/or policies. The course will meet its outcomes through one of three mechanisms: (1) student research with faculty mentor; (2) evidence based project; or (3) case study. 8-12 projects are anticipated to be supported by the combined DPT faculty to enable each cohort to complete this course through one of these three mechanisms. Each faulty member will annually mentor 1-4 groups through this capstone project. Weekly sessions will be led by the instructor(s) of record and the recitations will be mentored by a DPT faculty member assigned to each group. The weekly sessions will focus on application of concepts from prior evidence-based practice courses and critical evaluation of the literature. Prerequisites: Successful completion of all coursework in previous semesters

Prerequisite: Successful completion of all coursework in previous semesters.

**DPT 6282 - Healthcare Delivery I (2)**

This course provides an overview of the American health care system. It will review the system's origins and its various components and how these factors translate into current health care services. Forces influencing health care access, cost, and quality will be explored as well as the effects of the current environment on physical therapy practice, research and education. Prerequisites: Successful completion of all coursework in previous semesters

Prerequisite: Successful completion of all coursework in previous semesters. Corequisite: none.

**DPT 6291 - Anatomy Seminar II (1)**

The goal of this course is to enable an in-depth study of human anatomy. Students will perform an independent human cadaver dissection project under the supervision of the course instructor. Learning is enhanced as students share their results through formal presentations to their peers and clinical experts. Prerequisite: Successful completion of all coursework in previous semesters.

Prerequisite: Successful completion of all coursework in previous semesters.

**DPT 6314 - First Full-Time Clinical Education Experience (4)**

This is first of four full-time clinical education experiences during which students are engaged in clinical observation and supervised application of basic examination, evaluation, and intervention skills and procedures. An emphasis is placed on professional behaviors, safe patient handling techniques, analysis of examination findings, individualized treatment planning

and progression, and appropriate communication. Prerequisites: Successful completion of all coursework in previous semesters.

Prerequisite: Successful completion of all coursework in previous semesters. Corequisite: none.

**DPT 6315 - First Full-Time Clinical Education Experience (5)**

This is the first of four full-time clinical education experiences during which students are engaged in clinical observation and supervised application of basic examination, evaluation, and intervention skills and procedures. An emphasis is placed on professional behaviors, safe patient handling techniques, analysis of examination findings, individualized treatment planning and progression, and appropriate communication. Prerequisite: Successful completion of all coursework in previous semesters.

Prerequisite: Successful completion of all coursework in previous semesters.

**DPT 6342 - Orthotics & Prosthetics (2)**

This course introduces students to the management of patients with amputations, prosthetics, and orthotics. Instruction occurs via lecture, discussion of case scenarios, and guided laboratory practice. Relevant pathology and kinesiology are reviewed with an emphasis on examination, evaluation, diagnosis, clinical decision-making, prognosis, intervention, standardized assessments and relevant outcome measures. The appropriate use of orthotic and prosthetic technologies is also explored. Prerequisites: Successful completion of all coursework in previous semesters

Prerequisite: Successful completion of all coursework in previous semesters.

**DPT 6352 - Primary Care Practice (2)**

This course explores current issues in primary care practice and focuses specifically on aspects of primary care that are crucial to safe and effective practice. Students learn to perform higher level diagnostic screening procedures to identify selected medical diagnoses, and they practice clinical decision making to guide patient management and referral decisions. Students also learn to assess the health needs of individuals, groups and communities in order to develop programs for health, wellness, and injury prevention across the lifespan. Prerequisites: Successful completion of all coursework in previous semesters

Prerequisite: Successful completion of all coursework in previous semesters. Corequisite: none.

**DPT 6362 - Professional Development II (2)**

This course emphasizes a professional approach to clinically relevant topics such as cultural diversity; child, elder, and domestic abuse; workplace violence and harassment; end of life issues; and mental health concerns. Professional communications and the role of the professional as an educator and lifelong learner are also explored. Students present the results of their Evidence-based practice project in poster or platform format at the Rinker-Ross School of Health Sciences research forum. Prerequisites: Successful completion of all coursework in previous semesters

Prerequisite: Successful completion of all coursework in previous semesters.

**DPT 6372 - Clinical Practice IV (2)**

This course will explore various topics and treatment techniques used in contemporary practice in neuromusculoskeletal physical therapy. The focus will be on content that represents common aspects of contemporary practice in certain areas, but not necessarily required for entry-level practice. The topics of this class will build upon the foundation of material already presented in the other neuromusculoskeletal courses sequenced in the curriculum. Prerequisite: Successful completion of all coursework in previous semesters.

Prerequisite: Successful completion of all coursework in previous semesters.

**DPT 6382 - Healthcare Delivery II (2)**

This course focuses on contemporary managerial and leadership issues important to the provision high quality, fiscally sound healthcare. Topics include organizational structures, management principles, leadership and decision-making, quality assurance and accountability, financial and reimbursement concerns, marketing and customer relations, and the regulatory and external environment. Prerequisites: Successful completion of all coursework in previous semesters

Prerequisite: Successful completion of all coursework in previous semesters.

**DPT 7118 - Terminal Full-Time Clinical Education Experience I (8)**

During this full-time clinical education experience, students are engaged in clinical observation and supervised application of basic and comprehensive examination, evaluation, and intervention skills and procedures. An emphasis is placed on integration of professional behaviors, evaluation, physical therapy diagnosis, individualized treatment planning and progression, clinical reasoning, and documentation. Prerequisites: Successful completion of all coursework in previous semesters

Prerequisite: Successful completion of all coursework in previous semesters.

**DPT 7128 - Terminal Full-Time Clinical Education Experience II (8)**

During this full-time clinical education experience, students participate, with supervision, in the provision of major components of physical therapy care including screening, examination, integrative evaluation, differential diagnosis, prognosis, and procedural interventions. Students also design, prepare and provide an educational intervention. An emphasis is placed on the development of entry-level PT competencies and behaviors as students are given opportunities to practice components of the professional physical therapist's role. Prerequisites: Successful completion of all coursework in previous semesters

Prerequisite: Successful completion of all coursework in previous semesters.

**DPT 7162 - Professional Development II (2)**

Students participate in asynchronous learning sessions while on their terminal clinical education experiences. The emphasis is on sharing and reflecting on aspects of their experience pertinent to their development as professionals. Topics emphasized include leadership, quality and safety standards, financial management, and regulatory standards. Additional topics include a professional approach to clinically relevant topics such as abuse, human trafficking, workplace violence, harassment, end of life issues, and interprofessional collaborative practice. Professional roles as an educator and lifelong learner are also explored. Prerequisite: Successful completion of all coursework in previous semesters.

Prerequisite: Successful completion of all coursework in previous semesters.

**DPT 7212 - Terminal Full-Time Clinical Education Experience III (Other)**

In this final full-time clinical education experience, students engage in continued supervised application of comprehensive patient management skills including advanced examination, evaluation, diagnosis, prognosis and interventions. Students also provide an educational intervention, and participate in practice management and proper utilization of support personnel. At the completion of this experience students are expected to have demonstrated entry-level physical therapist competency and behaviors. Prerequisite: Successful completion of all coursework in previous semesters.

Prerequisite: Successful completion of all coursework in previous semesters.

**DPT 7214 - Terminal Full-Time Clinical Education Experience III (14)**

In this final full-time clinical education experience, students engage in continued supervised application of comprehensive patient management skills including advanced examination, evaluation, diagnosis, prognosis and interventions. Students also provide an educational intervention, and participate in practice management and proper utilization of support personnel. At the completion of this experience students are expected to have demonstrated entry-level physical therapist competency and behaviors. Prerequisites: Successful completion of all coursework in previous semesters

Prerequisite: Successful completion of all coursework in previous semesters.

**DPT 7262 - Professional Development III (2)**

Students participate in asynchronous learning sessions while on their final clinical education experience. The emphasis is on sharing and reflecting on aspects of their experience pertinent to their development as professionals. Topics emphasized include leadership, interdisciplinary collaboration, quality and safety standards, billing, rules, regulations, and laws.

Prerequisite: Successful completion of all coursework in previous semesters. Corequisite: none. Crosslisted as: none.

# EAS-Earth Science

**EAS 213 - Physical Geography (3)**

An analysis of the spatial and functional relationships among landforms, climate, soils, water, and the living world. This course also addresses the connections between environmental processes and human activity, such as human impact on the environment. **(Same as GEO 213)**

Crosslisted as: GEO 213.

**EAS 253 - Weather & Climate (3)**

Throughout this course, students will examine various elements of the atmosphere including motion systems, thermal characteristics, clouds and precipitation, weather map interpretation and analysis. Students will also identify the diverse climates of the United States. Student will learn meteorological concepts through visual, practical, and non-mathematical study.

**EAS 271 - Geology Laboratory (1)**

An introductory laboratory study of basic physical geology. The laboratory emphasizes skills needed for the identification of minerals and rocks, for the interpretation of land surface features based on topographic maps and for the understanding of folding, faulting, and rock relationships through the interpretation of geologic maps. Corequisite or Prerequisite: EAS/GLY 273 (same as GLY 271)

Prerequisite: EAS 273. Crosslisted as: GLY 271.

**EAS 273 - Geology (3)**

An introduction to the field of geology. Study of minerals and rocks and their formation, within the context of the earth's geologic history. Emphasis on soils, running water, and groundwater. Plate tectonics, glaciers, volcanoes, erosion, and weathering are also covered. Non-lab science only. (Same as GLY 273)

Crosslisted as: GLY 273.

# ECE-Electrical/Computer Engineering

**ECE 112 - Prototyping and Projects (2)**

ECE112 is an introduction to electrical and computer engineering which includes both mathematical and laboratory components. Students will use soldering irons, voltmeters, function generators, and oscilloscopes; Use Kirchhoff's laws to analyze DC circuits; Implement basic Boolean logic operations with logic gates; Read data sheets.

**ECE 112 - Prototyping and Projects (2)**

Is an introduction to electrical and computer engineering which includes both mathematical and laboratory components. Students will: use soldering irons, voltmeters, function generators, and oscilloscopes, start with a simple circuit diagram and build the circuit on a protoboard, calculate with vectors, matrices, and complex numbers, and plot translated and dilated sinusoidal functions.

**ECE 211 - Circuits Laboratory (1)**

The laboratory supports the Circuits class through the experimental characterization of passive circuits and their response prediction using component models. Students will: use typical electronics-laboratory test equipment for circuit characterization, write an experimental logbook, model electrical components to better predict a circuit's actual response, measure time response and frequency response. Corequisite: ECE 213

Corequisite: ECE 213.

**ECE 211 - Circuits Laboratory (1)**

This laboratory supports the Circuit Analysis course through the experimental characterization of passive circuits and their response prediction using component models. Students will: Use typical electronics-laboratory test equipment for circuit characterization; use simulation and mathematical tools; model electrical components to better predict circuit response; measure circuit responses in the time and frequency domains. Corequisite: ECE 213

Corequisite: ECE 213.

**ECE 213 - Circuit Analysis (3)**

This course prepares students for all subsequent circuits-based courses. Linear circuit analysis is studied by placing emphasis on the modified nodal admittance matrix method and circuit transformations. Students will: formulate a solution for any circuit containing terminally-defined resistors, capacitors, inductors, coupled inductors, ideal transformers, dependent and independent sources; use professional software to simulate circuits and to facilitate computations and mathematical operations. Corequisite: MA 164

Corequisite: MA 164.

**ECE 231 - Discrete Electronics Laboratory (1)**

This laboratory provides a comprehensive hands-on opportunity to implement electronic design concepts. The pn junction diode, and MOS transistors and their biasing techniques are extensively introduced to teach operational perspectives and circuit design. Students will: work in a team environment to perform and solve technical problems; understand load lines and design transistors to operate in different regions; design rectifiers, filters, multipliers, and clampers using pn junction diodes; design circuits using TINA simulation software; implement the design in proto board. Corequisite: ECE 233

Corequisite: ECE 233.

**ECE 233 - Discrete Electronics (3)**

Elementary electronic circuits for rectification, signal amplification, and signal conditioning are analyzed and designed using both linear and large-signal methods. Graphical, analytical, and simulation methods are used in circuit response prediction and characterization. Concepts in thermal design, feedback, and amplifier stability are introduced. Students will: Predict the response of uncontrolled rectifier circuits; design simple switches using field-effect and bipolar transistors; design and analyze signal amplifiers using discrete components; design and analyze signal amplifiers and filters using integrated circuits. Corequisite: ECE 231; Prerequisite: ECE 213

Prerequisite: ECE 213. Corequisite: ECE 231.

**ECE 233 - Discrete Electronics (3)**

This is a first course in semiconductor electronics with emphasis on electronic circuits and devices for low-voltage control, signal conditioning, and switching. Students will: explain the basic operation of junction diodes, BJT's, and FET's, including major limitations; analyze the operation of circuits using practical device models; use SPICE-based software as both an analysis and design tool for electronic circuits; design practical circuits using these devices Corequisite: ECE 231; Prerequisite: ECE 213

Prerequisite: ECE 213. Corequisite: ECE 231.

**ECE 261 - Digital Systems Laboratory (1)**

The lab provides a comprehensive hands-on opportunity to implement digital design concepts. Logic gates, logic tools, Hardware Description Language (HDL), and Field Programmable Gate Array (FPGA) design boards are used extensively to provide different variations of digital design. Students will: simplify and design combinational logic circuits including adders, comparators, multiplexers, decoders, and tri-state buffers, and predict their performances; design memory elements and sequential circuits such as latches, flipflops, counters, and frequency dividers; design state machines; use AND/OR/NOT/NAND/NOR logic gates and HDL to design combinational and sequential circuits and implement the design in

an FPGA board. Corequisite: ECE 263

Corequisite: ECE 263.

**ECE 261 - Digital Systems Laboratory (1)**

The lab provides a comprehensive hands-on opportunity to implement digital design concepts. Logic gates, logic tools, Hardware Description Language (HDL) and Field Programmable Gate Array (FPGA) design boards are used extensively to provide different variations of digital design. Students will: Work in a team environment to solve technical problems; understand switch-bounce problems and design a de-bounced switch; design adders, comparators, multiplexers, tri-state buffers and decoders using AND/OR/NOT/NAND/NOR logic gates; design memory cells, BCD-7-segment decoders, flip-flops and counters using logic gates and HDL; implement the design in an FPGA board. Corequisite: ECE 263

Corequisite: ECE 263.

**ECE 263 - Digital Systems (3)**

This course explores the introductory concepts of digital systems using combinational and sequential logic circuits. Digital design automation tools and Hardware Description Language (HDL) are also introduced. Students will: demonstrate that they understand number systems and Boolean algebra; understand and design combinational logic circuits including multiplexers, comparators, decoders, and adders; understand and design sequential logic circuits including latches, flip-flops and counters; design combinational and sequential circuits using HDL and perform timing analysis; understand the memory hierarchy, ROMs, RAMs and FLASH memories; understand Programmable Logic Devices (PLDs), CPLDs and FPGAs. Corequisite: ECE 261

Corequisite: ECE 261.

**ECE 263 - Digital Systems (3)**

This course explores the introductory concepts of digital systems using combinational and sequential logic circuits. Digital design automation tools and Hardware Description Language (HDL) are also introduced. Students will: recognize and differentiate between different number systems; simplify logic equations using Boolean algebra and Karnaugh maps; design combinational logic circuits including multiplexers, comparators, decoders, and adders; design sequential logic circuits including latches, flipflops, frequency dividers, and counters; design combinational and sequential circuits using HDL and perform timing analysis; explain the memory hierarchy, ROMs, RAMs, and FLASH memories. Corequisite: ECE 261

Corequisite: ECE 261.

**ECE 271 - Microcontrollers Laboratory (1)**

This course requires projects that respond to human input; provide humans with audio, image, or character output; communicate with another digital device using a serial communication protocol; apply timers to measure or source signals; use an ADC to measure and/or control a circuit. Students will: write programs in C/C++ and in assembly using a bit-level reference manual to configure working systems that employ a wide array of microcontroller peripherals; test, debug and document microcontroller software and hardware; use a multi-trace oscilloscope, logic analyzer and/or OCD to test a benchtop microcontroller system; work both alone and with at least one teammate; write more than one report or memo assessed for its value as technical, written communication; respect the IEEE Code of Ethics. Prerequisite: ECE 261; Corequisite: ECE 273

Prerequisite: ECE 261. Corequisite: ECE 273.

**ECE 271 - Microcontrollers Laboratory (1)**

This course teaches students to implement and test inexpensive hardware-software systems that offer a user interface, a digital signal generator, a sampled feedback controller, and subsystem interfacing. Students will: test a feedback system using experiments they design, and determine if project goals are met; design and implement a working feedback controller for a real physical system; team-up on most labs and on one formal report; solve the problem posed in the feedback project; report findings in formal written documents; use lab bench tools to develop and debug code. Prerequisite: ECE 261; Corequisite: ECE 273

Prerequisite: ECE 261. Corequisite: ECE 273.

**ECE 273 - Microcontrollers (3)**

This course teaches students to design inexpensive hardware-software systems that offer a user interface, a digital signal generator, a sampled feedback controller, and subsystem interfacing. Students will: analyze a microcontroller system for timing; solve problems written in prose by showing a hardware/software system that addresses the problem; empathize with stakeholders of a medical device; teach themselves to use an unfamiliar on-chip peripheral from the manufacturer's data sheet; address power consumption/battery life; use a compiler/assembler/ simulator to develop correctly working code; use the UML to aid design work; respect the IEEE code of ethics. Prerequisites: ECE 263 and either CS 1113 or MAE 201 or MAE 112; Corequisite: ECE 271

Prerequisite: ECE 263 and either CS 1113 or MAE 201 or MAE 112. Corequisite: ECE 271.

**ECE 273 - Microcontrollers (3)**

This course teaches students to design inexpensive hardware-software systems that offer a user interface, a digital signal generator, an analog interface, and serial communication. Students will: develop maintainable, organized programs in C; write a bit-level peripheral configuration to meet a specification, or predict the operation of a given configuration; design, analyze, and/or debug polling and interrupt-based solutions; address electrical concerns including power consumption; write small assembly programs and interpret the concepts of the programmer's view of a CPU and its buses. Prerequisites: ECE 263 and either CS 1113 or MAE 112; Corequisite: ECE 271

Prerequisite: ECE 263 and either CS 1113 or MAE 112. Corequisite: ECE 271.

**ECE 301 - Electrical Machines Laboratory (1)**

This laboratory supports the machines class through experimental work with dissectible and commercial electrical machines. Students will: Assemble and test commutator machines, synchronous machines, and induction machines; characterize machine performance in terms of regulation, efficiency, and power; synchronize a machine to the line and control real and reactive power flows; carry out tests to determine a generator's synchronous reactance. Corequisite: ECE 303

Corequisite: ECE 303.

**ECE 301 - Electrical Machines Laboratory (1)**

This laboratory supports the machines class through experimental work with dissectible and purpose-built machines. Students will: assemble and test commutator machines, synchronous machines, and induction machines; characterize machine performance in terms of regulation, efficiency and power; carry out tests to determine a synchronous generator's synchronous reactance Corequisite: ECE 303

Corequisite: ECE 303.

**ECE 303 - Electrical Machines (3)**

Rotating electrical machinery are studied from the magnetic-field interaction viewpoint. Machine operating principles are studied in detail and electrical circuit models are used to quantify machine/power system interactions. Students will: calculate the power-torque-speed performance of various DC and AC machines; model and calculate synchronous and induction machine performance in the steady state; calculate and present machine capability limits. Prerequisite: ECE 313; Corequisite: ECE 301

Prerequisite: ECE 313. Corequisite: ECE 301.

**ECE 303 - Electrical Machines (3)**

Rotating electrical machinery are studied with emphasis on the electrical machine as a power delivery component as opposed to a control component. The circuit model viewpoint is used throughout for analytical developments. Dynamic motor-load interactions are derived with the aid of the Laplace transform. Three-phase motor and generator electrical characteristics are studied using circuit models to calculate efficiency, power factor, and regulation. Students will: Predict the mechanical and electrical transients in a motor-load system; calculate the steady-state performance of synchronous motors with the aid of phasor diagrams; calculate the steady-state performance of synchronous generators operating stand-alone and line-connected with the aid of phasor diagrams; calculate the start-up current and the steady-state performance of induction motors. Prerequisite: ECE 313; Corequisite: ECE 301

Prerequisite: ECE 313. Corequisite: ECE 301.

**ECE 313 - Electrical Power (3)**

An introduction to three-phase power generation, transmission, distribution, and utilization. Steady-state power system performance measures: efficiency, ratings, voltage regulation, static stability, and reactive power control are used as unifying concepts across a study of the main power system components. Students will: calculate transmission line capacity, generator capability limits, transformer regulation, and load power consumption in balanced and unbalanced three-phase systems. Prerequisite: ECE 213

Prerequisite: ECE 213.

**ECE 313 - Electrical Power (3)**

An introduction to three-phase power distribution and utilization. Steady-state power system performance measures: efficiency, ratings, voltage regulation, and reactive power control are used as unifying concepts across a study of the main power system components. Fuse and circuit breaker protection methods are also discussed. Students will: Analyze single-phase radial circuits and design for power-factor correction; analyze three-phase radial circuits and design for power-factor correction; analyze unbalanced three-phase radial circuits with a specified load voltage; model and design three-phase transformer circuits. Prerequisite: ECE 213

Prerequisite: ECE 213.

**ECE 323 - Dynamic Electromagnetic Fields (3)**

This class discusses electromagnetic fields and calculations involving Maxwell's equations. Students will: apply Maxwell's equations in integral and differential form to calculate electromagnetic fields; calculate transmission line fields; calculate potentials; and describe how plane waves propagate in free space and in other uniform materials. The course may also cover antennas. Prerequisite: MA 233, PH 234

Prerequisite: MA 233, PH 234.

**ECE 333 - Analog IC's (3)**

The design and test of circuits that include analog integrated circuits such as operational amplifiers, ADCs and DACs, and modulation or demodulation devices. Students will: explain the basic operation of op-amps, including major limitations; analyze the operation of circuits using practical device models; use SPICE-based software as both an analysis and design tool; analyze frequency-domain and time-domain characteristics of analog systems that include filtering, feedback, modulation,

rectification, and sampling. Prerequisite: ECE 213

Prerequisite: ECE 213.

**ECE 333 - Analog IC's (3)**

The design and test of circuits that include analog integrated circuits such as operational amplifiers, ADCs and DACs, and modulation or demodulation devices. Students will: explain the basic operation of op-amps, including major limitations; analyze the operation of circuits using practical device models; use SPICE-based software as both an analysis and design tool; analyze frequency-domain and time-domain characteristics of analog systems that include filtering, feedback, modulation, rectification, and sampling. Prerequisite: ECE 233

Prerequisite: ECE 233.

**ECE 343 - Analog Signals (3)**

This course bridges the gap between the device-based topics of circuits and the signals-and-systems topics of DSP, controls, and communications. Mathematical concepts relating to complex numbers and matrices are developed and frequency domain analysis is discussed in depth. Students will: calculate with complex numbers; analyze continuous-time circuits in the time domain, phasor domain, and frequency domain, and decide the appropriate domain to use for analysis. Prerequisites: MA 164, and ECE 213 with a grade of "C" or above, and ECE 263 with a grade of "C" or above

Prerequisite: MA 164, ECE 213 with a grade of "C" or above, ECE 263 with a grade of "C" or above.

**ECE 343 - Analog Signals (3)**

This course bridges the gap between the device-based topics of circuits and the signals-and-systems topics of DSP, controls, and communications. Advanced mathematical concepts for linear-system analysis and signal characterization are developed in depth. Emphasis is placed on transform methods and network functions leading to generalized solution methods for periodic and non-periodic inputs. Students will: Convert between the forms of Fourier series and calculate signal power; Fourier transform time functions and calculate signal energy; Laplace transform time functions and find network functions; use the Fourier series, Fourier transform, and Laplace transform in the solution of dynamic circuits.. Prerequisites: MA 164, and ECE 213 with a grade of "C" or above, and ECE 263 with a grade of "C" or above

Prerequisite: MA 164, ECE 213 with a grade of "C" or above, ECE 263 with a grade of "C" or above.

**ECE 351 - CMOS VLIS Laboratory (1)**

The lab provides an extensive opportunity to implement complementary metal oxide semiconductor (CMOS) very large-scale integration (VLSI) design concepts. Students will: Use CMOS techniques to design and predict the performance of NOT/NAND/AND/NOR/OR logic gates; design area and delay-constrained 8-bit equality comparator, adder, and multiplexer circuits; design transistors to drive large loads; design an 8-bit low power ALU circuit with PAD frames. Corequisite: ECE 353

Corequisite: ECE 353.

**ECE 351 - CMOS VLIS Laboratory (1)**

This lab provides an extensive opportunity to implement CMOS VLSI design concepts. Students will: use VLSI design tools for design projects on inverters, multiplexers, comparators, oscillators, and flip flops. Corequisite: ECE 353

Corequisite: ECE 353.

**ECE 353 - CMOS VLSI Design (3)**

The design of special-purpose digital systems using very large-scale integration (VLSI) technology is investigated using

complementary metal oxide semiconductors (CMOS). MOSFET modeling, dynamic power dissipation, clocking strategies, and transistor delays are considered. Students will: appraise MOSFET device characteristics; estimate parasitic R, and C delays; compare different-sized transistors; design static, dynamic, low-power, and sequential VLSI circuits and calculate power dissipation; discuss clocking strategies. Prerequisite: ECE 233

Prerequisite: ECE 233. Corequisite: ECE 351.

**ECE 353 - CMOS VLSI Design (3)**

The design of special purpose digital systems using VLSI technology is investigated using CMOS technology. MOSFET modeling, dynamic power dissipation, clocking strategies and transistor delays are considered. Students will: understand MOS device modeling and DC transfer characteristics; understand parasitic R,L,C and delay estimation and transistor sizing; understand sequential circuits and clocking strategies; design static and dynamic CMOS VLSI circuits; understand dynamic power dissipation and low power VLSI design techniques; use VLSI tools to simulate and produce technical reports. Prerequisites: ECE 233; Corequisite: ECE 351

Prerequisite: ECE 233. Corequisite: ECE 351.

**ECE 361 - Logic & Computer Design Laboratory (1)**

The lab provides an opportunity to design and implement digital design concepts in Field Programmable Gate Arrays (FPGAs). The lab serves a twofold purpose. In the first half of the semester, students will: design and verify combinational circuits, sequential circuits, and state machines using HDL and schematic tools and implement the design in an FPGA. In the second half of the semester, students will: work in a group setting to come up with a challenging project; design and implement the project in an FPGA; and demonstrate and present the design. Corequisite: ECE 363

Corequisite: ECE 363.

**ECE 361 - Logic & Computer Design Laboratory (1)**

The lab provides an opportunity to implement digital design concepts in Altera Field Programmable Gate Arrays (FPGAs) and Complex Programmable Logic Devices (CPLDs). Students will: complete assigned design projects using HDL and schematic tools, and implement completed design projects using Altera FPGAs and CPLDs; work in a group setting to implement a challenging design project on the design board and make a group presentation of this design. Corequisite: ECE 363

Corequisite: ECE 363.

**ECE 363 - Logic & Computer Design (3)**

The course builds on the Digital Systems class and provides an in-depth analysis of digital design and computer architecture. Core topics include Finite State Machine (FSM) controllers and pipeline design using Hardware Description Language (HDL). Students will: understand and design sequential circuits and perform timing analysis; understand and design FSM controllers and next state decoders; understand and design pipelined processors and cache memories; design of an onboard 32x32 register file; work in a group setting to come up with innovative ideas to design and implement an FSM, a controller and a cache memory. Prerequisite: ECE 263; Corequisite: ECE 361

Prerequisite: ECE 263. Corequisite: ECE 361.

**ECE 363 - Logic & Computer Design (3)**

The course builds on the Digital Systems class and provides an in-depth analysis of digital design and computer architecture. Core topics include Finite State Machine (FSM) controllers and pipeline design using Hardware Description Language (HDL). Students will: design and analyze combinational and sequential circuits; perform timing analysis; design and implement Finite State Machine(FSM) controllers and next-state decoders; Identify a single-cycle processor; Identify, design, and implement a pipelined processor; explain cache and virtual memories. Prerequisite: ECE 263 Corequisite: ECE 361

Prerequisite: ECE 263. Corequisite: ECE 361.

**ECE 371 - Embedded Systems Laboratory (1)**

In support of ECE 373, this lab puts students in small teams to explore isolated subsystems from the course project in the usual lab format, and then provides structured time to achieve and demonstrate progress in the project. Students will: work in small teams; show that they can use the tools and techniques of modern embedded systems to implement their designs; assume responsibility for designing the tests or experiments needed to verify their work; demonstrate communication skills in formal reports and demonstrations. Corequisite: ECE 373

Corequisite: ECE 373.

**ECE 371 - Embedded Systems Laboratory (1)**

In support of ECE 373, this laboratory course provides some weekly exercises and a project. The topics include developing a modular, cooperative system to meet timing requirements; and developing experience with an RTOS. Students will: show that they can use the tools and patterns of modern embedded systems to implement their designs; assess and approach compliance to a coding standard for mission-critical systems; work in small teams using version control; assume responsibility for designing the tests or experiments needed to verify their work; demonstrate communication skills in demonstrations and in written reports that include UML. Corequisite: ECE 373

Corequisite: ECE 373.

**ECE 373 - Embedded Systems (3)**

Building on ECE 273 (Microcontrollers), this course focuses on real-time cooperative multitasking and RTOS, and includes a design project to explore these ideas. Students will: explain and apply cooperative and preemptive multitasking concepts; design and implement an embedded system with a human interface and demanding timing requirements; identify and apply software patterns and idioms for embedded system design; compare and contrast version control concepts; compare and contrast testing techniques. Prerequisite: ECE 273; Corequisite: ECE 371

Prerequisite: ECE 273. Corequisite: ECE 371.

**ECE 373 - Embedded Systems (3)**

Building on ECE 273 (Microcontrollers), this course focuses on real-time multitasking and RTOS and includes a design project to explore these ideas, and the course also looks at enabling techniques such as mixed C and assembly, control of linking, external memory, self-programming, and fail-safety. Students will: explain and apply real-time multitasking concepts; design and implement an embedded system; design recovery from exceptional conditions; incorporate into their work complex peripherals like PWM-capable timers. Prerequisite: ECE 273; Corequisite: ECE 371

Prerequisite: ECE 273. Corequisite: ECE 371.

**ECE 393 - Software Analysis & Design (3)**

Teaches the code development process to students who can use an object-oriented computer language.Students will: identify

activities of software project engineering; write a formal requirements document; perform object-oriented analysis of client requirements; use UML class and sequence diagrams to support object-oriented design; apply some software design patterns; implement your designed software in a team supported by a version-control tool; use a professional caliber GUI library to advantage; and follow coding standard. Prerequisite: CS 1123

Prerequisite: CS 1123.

**ECE 3051 - Junior-Year Laboratory (1)**

This course is intended to secure and to extend student knowledge of sophomore fundamentals by posing multi-week laboratory exercises in the Junior year that move beyond the lab exercises required of Sophomores. The course is divided into halves, one for a project that extends circuit analysis and/or discrete electronics, and the other for a project that extends digital and/or microcontroller systems. Prerequisites: ECE 211 and ECE 231

Prerequisite: ECE 211 and ECE 231.

**ECE 3051 - Junior-Year Laboratory (1)**

This course is intended to secure and to extend student knowledge of sophomore fundamentals by posing multi-week laboratory exercises in the Junior year that move beyond the lab exercises required of Sophomores. Students will: Apply human safety limits to proposed electrical work and assess the suitability of a given circuit component to a proposed voltage or current; Design, implement, and test a high-gain, discrete-transistor amplifier, including an assessment of its linearity; Design, implement, and test circuits combining analog and digital components and concepts; Implement switching circuits for currents over one amp; Use modern benchtop test equipment; Produce substantial reports - at least one written and one oral. Prerequisites: ECE 211 and ECE 231

Prerequisite: ECE 211 and ECE 231.

**ECE 401 - Special Topics in Electrical & Computer Engineering (1)**

Special Topics in ECE is a non-recurring advanced course in a specialist area of electrical and computer engineering. The course is intended to impart a depth of knowledge in a currently important technical area. The course may be used to satisfy the requirements for an electrical engineering or computer engineering concentration elective. Prerequisite: Varies according to the Special Topic

Prerequisite: Varies according to the Special Topic.

**ECE 402 - Special Topics in Electrical & Computer Engineering (2)**

Special Topics in ECE is a non-recurring advanced course in a specialist area of electrical and computer engineering. The course is intended to impart a depth of knowledge in a currently important technical area. The course may be used to satisfy the requirements for an electrical engineering or computer engineering concentration elective. Prerequisite: Varies according to the Special Topic

Prerequisite: Varies according to the Special Topic.

**ECE 403 - Direct Generation Techniques (3)**

The direct electrical energy conversion and storage methods are studied in depth. Direct conversion involves the conversion of energy directly to electrical form with no electromechanical interface. Students will: study conversion technologies including heat transfer, chemical cells, solar arrays, and fuel cells. The course also investigates the current and future trends in energy storage techniques. Prerequisite: ECE 213

Prerequisite: ECE 213.

**ECE 433 - Power Electronics (3)**

Building on Discrete Electronics, this course addresses the concerns that arise in the design of semiconductor circuits and devices due to larger voltages and currents. Students can explain and quantify the performance of three-phase AC to DC and

DC to AC converters, the performance of four-quadrant DC to DC converters, and quantify the effect of harmonic-producing electronics loads on a radial power system. Prerequisite: ECE 233

Prerequisite: ECE 233.

**ECE 433 - Power Electronics (3)**

Power electronics addresses the design and simulation of semiconductor circuits for power applications. Emphasis is placed on voltage-source designs. Diodes, SCR's, triacs and MOSFET's are applied in the design and simulation of several power circuits. Fourier series is used to quantify the voltages and currents in terms of their average, rms, and distortion values. Students will: Design and simulate single- and three-phase rectifiers; design and simulate single- and three-phase invertors; design and simulate DC to DC convertors; use the system impedance to quantify the effect of current distortion on a power system. Prerequisite: ECE 233

Prerequisite: ECE 233.

**ECE 441 - Communication Systems Laboratory (1)**

A lab to investigate means of and results of moderate-frequency signal processing in the service of communications, using both integrated circuits and simulated components. Students will: determine bandwidth and bands of interest; identify distortion and aliasing; and apply lab tools to moderate-frequency designs. Corequisite: ECE 443

Corequisite: ECE 443.

**ECE 441 - Communication Systems Laboratory (1)**

A lab to investigate means of and results of moderate-frequency signal processing in the service of communications, using both integrated circuits and simulated components. Students will: determine bandwidth and bands of interest; identify distortion and aliasing; and apply lab tools to moderate-frequency designs. Corequisite: ECE 443

Corequisite: ECE 443.

**ECE 443 - Communication Systems (3)**

The course investigates ways of processing a signal both to prepare it for effective transmission through some medium or media that may be carrying other signals, and to reconstruct the original signal at the receiving end. Students will: analyze and design basic communication systems using block-diagram models of filters, samplers, and modulators; compare and contrast multiple-access communication techniques including AM, FM, coding and keying; calculate the basic quantities such as channel capacity, probability of error, and bandwidth needed to transmit analog or digital signals in base-band or in pass-band. Prerequisite: ECE 343; Corequisite: ECE 441

Prerequisite: ECE 343. Corequisite: ECE 441.

**ECE 453 - Random Processes in Electrical & Computer Engineering (3)**

Concepts of random processes are applied to electrical and computer engineering applications. In addition to the mathematical topics described below, each student will present on a particular application which may include: oversampling A/D, queuing inside a computer processor, quality control, voice recognition, and interferometric measurements. Students will: describe a random process by a probability density and probability distribution; identify whether a process is stationary and ergodic; compute the auto-correlation, cross-correlation, spectral density and cross-spectral density of a random process. Prerequisite: MA 393

Prerequisite: MA 393.

**ECE 461 - Digital Signal Processing Laboratory (1)**

MATLAB is used to demonstrate concepts from digital signal processing. Students should be able to: Sample and filter audio signals; filter images; demonstrate effects of insufficient sampling, aliasing, rounding, or instability; design digital filters. Corequisite: ECE 463

Corequisite: ECE 463.

**ECE 461 - Digital Signal Processing Laboratory (1)**

This course emphasizes analysis and design of systems for processing digital signals using frequency domain techniques. Students will: analyze signals in the frequency domain; describe digital systems in the frequency domain; sample, quantize, and reconstruct signals; design digital filters. Corequisite: ECE 463

Corequisite: ECE 463.

**ECE 463 - Digital Signal Processing (3)**

This course emphasizes analysis and design of sampling and processing systems for discrete-time signals. Students will: specify a sampling rate to meet requirements; use computer tools to analyze signals and to implement batch processing or simulation of DT signals and systems; represent DSP signals and systems in conventional diagrams; apply the FFT, frequency sampling, and data windows to signal analysis and filter design problems; apply at least one more-specialized technique in DSP like sample-rate conversion, matched filtering, or signal-shaping. Prerequisite: ECE 343

Prerequisite: ECE 343.

**ECE 463 - Digital Signal Processing (3)**

This course emphasizes analysis and design of systems for processing digital signals using frequency domain techniques. Students will: analyze signals in the frequency domain; describe digital systems in the frequency domain; sample, quantize, and reconstruct signals; design digital filters. Prerequisite: ECE 343

Prerequisite: ECE 343.

**ECE 481 - Instrument Systems Laboratory (1)**

This laboratory course supports Instrument Systems and relates to data acquisition of both analog and digital signals. Students will: analyze circuits for measuring with resistive and capacitive sensors; identify noise sources in instrumentation systems; compare wired and wireless bus technologies; use Labview, Python, or other software tools for data acquisition and analysis; design and test a low-cost hand-held sensor system. Corequisite: ECE 483

Corequisite: ECE 483.

**ECE 481 - Instrument Systems Laboratory (1)**

This course discusses data acquisition of both analog and digital signals. Students will: design a low-cost hand-held sensor system; select components for a hand-held sensor system within cost and size constraints; solve problems related to calculating noise in measurement systems; propose possible sensor circuits and select the best solution; construct, test, and debug a hand-held sensor system. Corequisite: ECE 483

Corequisite: ECE 483.

**ECE 483 - Instrument Systems (3)**

This course discusses theoretical and practical ideas related to data acquisition of both analog and digital signals. Students will: analyze input data from sensors; characterize signal noise; compare GPIB, USB, and other data buses for instrumentation systems; use Labview or Matlab for data acquisition and analysis. Corequisite: ECE 481; Prerequisite: ECE 213

Prerequisite: ECE 213. Corequisite: ECE 481.

**ECE 483 - Instrument Systems (3)**

This course discusses theoretical and practical ideas related to data acquisition of both analog and digital signals. Students will:

analyze circuits for measuring with resistive and capacitive sensors; identify noise sources in instrumentation systems; compare wired and wireless bus technologies; use Labview, Python, or other software tools for data acquisition and analysis; design and test a low-cost hand-held sensor system. Corequisite: ECE 481; Prerequisite: ECE 213

Prerequisite: ECE 213. Corequisite: ECE 481.

**ECE 4001 - Contemporary Issues for Engineers (1)**

This is a seminar-based weekly course covering global perspectives on business and engineering, and the effects and responsibilities of engineers in society. Students will: understand sustainability and diversity and develop a broader perspective necessary to understand the impact of engineering solutions in an environmental and societal context; understand the complex global economy. Prerequisite: Senior standing

Prerequisite: Senior standing.

**ECE 4001 - Contemporary Issues for Engineers (1)**

This is a weekly seminar-based course covering global perspectives and responsibilities of engineers in society. Students will: understand sustainability and diversity; identify stakeholders; develop a broader perspective necessary to understand the impact of engineering solutions in an environmental and societal context; recognize ethical obligations; give oral presentations and write a paper on the ethical issues raised by the articles read.  Prerequisite: senior standing

Prerequisite: Senior standing.

**ECE 4002 - Project Management (2)**

Students will: work with a team to identify or elicit details of end-user needs; produce and present a project proposal; identify and assign responsibilities to team members based on an accepted proposal; work across disciplines to deliver a product or service to a client; explain both highly-structured and more agile engineering design processes. Prerequisite: Advisor's consent

Prerequisite: Advisor's consent.

**ECE 4113 - Special Topics in Electrical & Computer Engineering (3)**

Special Topics in ECE is a non-recurring advanced course in a specialist area of electrical and computer engineering. The course is intended to impart a depth of knowledge in a currently important technical area. The course may be used to satisfy the requirements for an electrical engineering or computer engineering concentration elective. Prerequisite: Varies according to the Special Topic

Prerequisite: Varies according to the Special Topic.

**ECE 4403 - Senior Design I (3)**

Students will: work with a team to identify or elicit details of end-user needs; produce and present a project proposal; identify and assign responsibilities to team members based on an accepted proposal; work across disciplines to deliver a product or service to a client with particular regard to ethical concerns; explain both highly-structured and more agile engineering design

processes. Prerequisite: Advisor's consent

Prerequisite: Advisor's consent.

**ECE 4403 - Senior Design I (3)**

This class is the first part of the capstone design project. Students will: work with a team to identify or elicit details of end-user needs; produce and present a project proposal; identify and assign responsibilities to team members based on an accepted proposal; work across disciplines to deliver a product or service to a client; identify their discipline's code of professional ethics; discuss the role of engineering in public policy and the need for knowledge of current affairs. Prerequisite: Advisor's consent

Prerequisite: Advisor's consent.

**ECE 4503 - Senior Design II (3)**

Students will: design and prototype a product; work with team members from other disciplines to collectively solve engineering problems; obtain and utilize information sources to solve engineering problems; consider the perspective of stakeholders as an integral part of the design process; incorporate appropriate engineering standards; identify economic, environmental, social, ethical, and safety implications of the design; demonstrate communication skills necessary for successful teamwork; write a formal report that documents the entire design-cycle, from the initial concept to a functioning prototype; and give an oral report presenting the final product. Prerequisite: EE Majors: ECE 4403, ECE 343, ECE 483; CPE Majors: ECE 4403, ECE 343, ECE 373; SE Majors: ECE 4403, CS 2103, CS 2503 or SE 353

Prerequisite: EE Majors: ECE 4403, ECE 343, ECE 483; CPE Majors: ECE 4403, ECE 343, ECE 373; SE Majors: ECE 4403, CS 2103, CS 2503 or SE 353.

# ECO-Economics

**ECO 203 - Survey of Economics (3)**

This course aims to provide an overview of the relevant areas of economics. After developing basic economic principles, such as the rationality assumption, the marginal benefit and marginal cost framework, and demand and supply analysis, equal attention is devoted to the principles of microeconomics and macroeconomics. Areas of study include firm decisions under various market structures, the role of money, central bank, and interest rates in the economy, as well as differing views on how an economy grows. Prerequisite: MA 113

Prerequisite: MA 113.

**ECO 213 - Microeconomics (3)**

Introduction to the theory of demand and supply and price determination in market economies. The study of individual consumers and producers, different market structures and the distribution of income. Prerequisite: MA 113

Prerequisite: MA 113.

**ECO 223 - Macroeconomics (3)**

Introduction to the theory of national income determination for the United States and other global economic systems. The study of fiscal and monetary policy tools and the government's role in promoting stability and growth, and the causes of unemployment, inflation, and trade deficits.  Prerequisite: MA 113

Prerequisite: MA 113.

**ECO 323 - Money & Banking (3)**

This course is a study of the principles of monetary economics. An analysis of the structure and operation of financial institutions and the Federal Reserve System is included. The function of monetary policy within the framework of macroeconomic theory is examined. (Same as FIN 323) Prerequisite: ECO 223 or ECO 203

Prerequisite: ECO 223 or ECO 203. Crosslisted as: FIN 323.

**ECO 353 - Healthcare Regulations (3)**

This course will prepare learners to define healthcare regulations and accreditation standards. Additionally, learners will determine how to comply with regulations, avoiding costly violations. This course will also address the economic impact of regulations on the healthcare industry.

**ECO 373 - Introduction to Econometrics (3)**

This course is designed for the finance and economics students as a continuation of MA 253 (Statistics). Students will first revisit the topics of probability, distributions, and hypothesis testing, exploring these topics more thoroughly. Most of the semester will be devoted to building solid theoretical and practical foundation of econometrics. Students will proceed from the simple regression model onto multiple regression analysis in the context of cross-sectional data, time series data, and finally panel data. Violations and fixes to serial correlation and heteroskedasticity problems will be studied. Students will be asked to demonstrate and apply the concepts studied while carrying out an empirical research project. (Same as FIN 373) Prerequisite: ECO 223 or ECO 203, MA 253

Prerequisite: ECO 223 or ECO 203, MA 253 . Crosslisted as: FIN 373.

**ECO 383 - International Economics (3)**

Introduction to the fundamental theories of international specialization and exchange, and international payments; the analysis of processes and organizations for maintaining equilibrium of international economic relationships. Prerequisite: ECO 223 or ECO 203

Prerequisite: ECO 223 or ECO 203.

**ECO 453 - Business & Public Policy (3)**

This course includes an analysis of the legal, political and economic framework that has shaped public policy toward business in the United States. It will include the methods as to how public policy is created and its implications for management decision making. The issues that this course will be concerned with are: how public policy is related to societal, community, employee, consumer, and environmental concerns and their implication for business. (Same as BA 403) Corequisite: MGT 363

Corequisite: MGT 363. Crosslisted as: BA 403.

**ECO 4001 - Independent Studies in Economics (1)**

Credit earned through directed reading, independent study, and research or supervised field work. Maximum 4 hours credit.

**ECO 4002 - Independent Studies in Economics (2)**

Credit earned through directed reading, independent study, research or supervised field work. Maximum 4 hours credit.

**ECO 4003 - Independent Studies in Economics (3)**

Credit earned through directed reading, independent study, research or supervised field work. Maximum 4 hours credit.

**ECO 5033 - Micro & Macro Economic Decision Making (3)**

This course in Micro and Macroeconomics is designed to provide students with a unified framework that can be used to analyze micro and macroeconomic issues such as growth, productivity, labor markets, wages, business cycles, inflation, money, interest rates, monetary policy, fiscal policy, and financial crises. The course is a mixture of macro theory and real-world applications. Analytical models will be developed that stress the microeconomics foundations of aggregate outcomes which will then be applied to the recent experience of the United States and global countries.

Prerequisite: None.

# EDU-Education

**EDU 111 - Education Exploration (1)**

A study of teaching as a career. The candidate examines conditions and responsibilities at lower elementary, upper elementary, middle school, high school, and alternative school levels. Clinical experience. Prerequisite: strong interest in a teacher education major

Prerequisite: Strong interest in a teacher education major.

**EDU 181 - Introduction to Teaching Students with Mild Exceptional Needs (1)**

A study of the historical, philosophical, ethical, and legal foundations of American special education. Content includes current issues, state and federal policies, and the rights, roles, and responsibilities of all stakeholders regarding the education of students with mild exceptional needs. Clinical experience. Prerequisites: EDU 111

Prerequisite: EDU 111.

**EDU 1001 - Montessori Exploration (EL 1) (1)**

This course provides an overview of Montessori philosophy and methodology for the Elementary I (students ages 6-9) classroom. Clinical experience.

**EDU 1103 - Montessori E-I EC Overview (3)**

This course is a comprehensive introduction to child development and the Montessori philosophy/theory, methodology, and materials usage in the Montessori Early Childhood environments, that is intended to provide background and preparation for lower elementary teacher candidates pursuing Montessori qualifications to teach in Montessori lower elementary classrooms. The course is specifically focused on coverage of Montessori theories of child development, preparation of the environment and adult, classic materials and methodologies, and significant presentations that are precursors to the Elementary I curriculum.

Crosslisted as: EDU 1100.

**EDU 1100 - Montessori E-I EC Overview (0)**

This course is a comprehensive introduction to child development and the Montessori philosophy/theory, methodology, and materials usage in the Montessori Early Childhood environments, that is intended to provide background and preparation for lower elementary teacher candidates pursuing Montessori qualifications to teach in Montessori lower elementary classrooms. The course is specifically focused on coverage of Montessori theories of child development, preparation of the environment and adult, classic materials and methodologies, and significant presentations that are precursors to the Elementary I curriculum.

Crosslisted as: EDU 1103.

**EDU 1110 - Montessori E-I Philosophy/Child Development (3)**

This course addresses the characteristics and physical, cognitive, and social-emotional development of children ages 6-12 years old as well as introducing the philosophical underpinnings of the Montessori lower elementary educational methodology and philosophy as it applies to children of this age range. The course includes topics such as preparation of the teacher and environment for learning, integrated curriculum, Montessori's vision of "cosmic education," peace education, classroom/student observation strategies and practices, and methods for encouraging student autonomy and independence. This course is a blended online and in-person course.

Crosslisted as: EDU 1113.

**EDU 1113 - Montessori E-I Philosophy/Child Development (3)**

This course addresses the characteristics and physical, cognitive, and social-emotional development of children ages 6-12 years old as well as introducing the philosophical underpinnings of the Montessori lower elementary educational methodology and philosophy as it applies to children of this age range. The course includes topics such as preparation of the teacher and

environment for learning, integrated curriculum, Montessori's vision of "cosmic education," peace education, classroom/student observation strategies and practices, and methods for encouraging student autonomy and independence. This course is a blended online and in-person course.

Crosslisted as: EDU 1110.

**EDU 211 - Education Immersion (1)**

A study of the responsibilities of teaching in a specific setting. The candidate is assigned to an area school according to subject matter and grade level of planned certification. Clinical experience. Prerequisite: EDU 111; education major

Prerequisite: EDU 111; education major.

**EDU 222 - Educational Psychology for the Elementary Teacher (2)**

A study of the application of basic psychological principles to classroom instruction and the school environment at the K-6 level. Current research about motivation, theories and philosophies of how children learn, and major theories of child growth and development are explored. All developmental domains of children from birth through early adolescence are examined. Prerequisite: EDU 111

Prerequisite: EDU 111.

**EDU 232 - Educational Psychology for the Middle & Secondary School Teacher (2)**

A study of the application of basic psychological principles to classroom instruction and the school environment at the middle and high school levels. Motivation, principles of learning, crucial issues and alternative learning environments are explored. All developmental domains of the early adolescent through young adult are examined. Clinical experience. Prerequisite: EDU 111

Prerequisite: EDU 111.

**EDU 252 - School & Community Health (2)**

Knowledge of observing and understanding the health needs of school-aged children. The role of the school health program, students' habits, attitudes and understanding of good health practices are explored. Focus on health programs amenable to community action.

**EDU 273 - Issues in American Education (3)**

A study of the historical, philosophical, and social aspects of American public education. The legal and financial basis of public education and the rights and responsibilities of teachers and students are reviewed. Significant professional issues are identified and explored.

**EDU 282 - The Development of Students with Mild Except Needs (2)**

A study of the characteristics and needs of students with disabilities. Factors that affect the learning and development of students with mild exceptional needs are examined. Prerequisite: EDU 181

Prerequisite: EDU 181.

**EDU 2100 - Montessori E-I Mathematics Curriculum (0)**

This course is an introduction to the Montessori methodology for elementary classrooms, specifically focused on mathematics—arithmetic. The course introduces concrete materials and methods for assisting lower elementary children in arithmetic, from developing a grasp of basic numeration through advanced levels of the four operations, memorization of mathematic facts, and beginning fractions—all using Montessori hands-on materials. Philosophical underpinnings will illuminate how elementary children develop their mathematical minds—the ability to measure and abstract, to reason, to make comparisons and draw conclusions, to think logically and be exact. This course takes place in a clinical lab and hands-on practice with materials is required. Prerequisites: EDU 1100/EDU 1103 and EDU 1110/EDU 1113

Prerequisite: EDU 1100/EDU 1103 and EDU 1110/EDU 1113. Crosslisted as: EDU 2103.

**EDU 2103 - Montessori E-I Mathematics Curriculum (3)**

This course is an introduction to the Montessori methodology for elementary classrooms, specifically focused on mathematics—arithmetic. The course introduces concrete materials and methods for assisting lower elementary children in arithmetic, from developing a grasp of basic numeration through advanced levels of the four operations, memorization of mathematic facts, and beginning fractions—all using Montessori hands-on materials. Philosophical underpinnings will illuminate how elementary children develop their mathematical minds—the ability to measure and abstract, to reason, to make comparisons and draw conclusions, to think logically and be exact. This course takes place in a clinical lab and hands-on practice with materials is required. Pre-requisites: EDU 1100/EDU 1103 and EDU 1110/EDU 1113

Prerequisite: EDU 1100/EDU 1103 & EDU 1110/EDU 1113. Crosslisted as: EDU 2100.

**EDU 2110 - Montessori E-I Cultural Geography Curriculum (0)**

This course is an introduction to the hands-on materials and methodology for lower elementary traditional and Montessori classrooms, specifically focused on coverage of integrated cultural curriculum, including introductory work in history; human, physical, and political geography; biology; and physical science. The course addresses content topics of human geography and world cultures, human habitation, migration, and the interface between humans, their environments, and the idea of dwelling. Emphasis is on the methods, materials, and philosophical underpinnings of the cultural subjects through a holistic and integrated approach. This course takes place in a clinical lab and hands-on practice with materials is required. Prerequisites: EDU 1100/EDU 1103 & EDU 1110/EDU 1113

Prerequisite: EDU 1100/EDU 1103 & EDU 1110/EDU 1113. Crosslisted as: EDU 2113.

**EDU 2113 - Montessori E-I Cultural Geography Curriculum (3)**

This course is an introduction to the hands-on materials and methodology for lower elementary traditional and Montessori classrooms, specifically focused on coverage of integrated cultural curriculum, including introductory work in history; human, physical, and political geography; biology; and physical science. The course addresses content topics of human geography and world cultures, human habitation, migration, and the interface between humans, their environments, and the idea of dwelling. Emphasis is on the methods, materials, and philosophical underpinnings of the cultural subjects through a holistic and integrated approach. This course takes place in a clinical lab and hands-on practice with materials is required. Prerequisites: EDU 1100/EDU 1103 & EDU 1110/EDU 1113

Prerequisite: EDU 1100/EDU 1103 & EDU 1110/EDU 1113. Crosslisted as: EDU 2110.

**EDU 2200 - Montessori E I-II Mathematics and Geometry Curriculum (0)**

This course is a continuation of the Montessori methodology for Elementary II classrooms, specifically focused on both mathematics and geometry. The course relies on concrete materials and methods for assisting upper elementary children in arithmetic, from developing a grasp of multiples, factors and divisibility through advanced levels of cube roots, decimals, base systems, and statistics—all using Montessori hands-on materials. In geometry students will work with concepts such as equivalence, similarity, congruence, area, and volume–again, using Montessori materials for learning. Philosophical underpinnings will illuminate how elementary children develop their mathematical minds—the ability to measure and abstract, to reason, to make comparisons and draw conclusions, to think logically and be exact.
This course takes place in a clinical lab and hands-on practice with materials is required.

Prerequisite: Admission to the E I-II program.

**EDU 2210 - Montessori E I-II Cultural Curriculum (0)**

This course gives an advanced view of the cultural subjects for a Montessori upper elementary classroom (students ages 9-12), and includes the academic topics of history, geography, world cultures, and the sciences. This course takes place in a clinical lab and some hands-on practice with materials is required.

Prerequisite: Admission to the E I-II program.

**EDU 301 - Instructional Design Clinical Experience (1)**

An in-depth study of the responsibilities of teaching in a specific setting. The candidate is assigned to an area school according to subject matter and grade level of planned certification. Clinical experience. Corequisite: EDU 303

Corequisite: EDU 303.

**EDU 303 - Instructional Design (3)**

A study of the problems, purposes, and responsibilities of teaching, including educational standards, deductive and inductive instructional strategies, assessment, needs of diverse learners, daily and long-range planning, classroom management, and parental involvement in the schools. Corequisite: EDU 301, Admission to Professional Education Sequence

Corequisite: EDU 301, Admission to Professional Education Sequence.

**EDU 312 - Exceptional Learners (2)**

A study of exceptional children and programs in K-12 educational settings. Areas of study are program design, identification processes, curriculum development, inclusion, mainstreaming and program evaluation. Special education areas of concentration include learning disabilities, visual/hearing impaired, physically handicapped, emotionally handicapped, and mentally handicapped. (Gifted area of concentration includes academic.) Clinical experience.

**EDU 322 - Culturally Responsive Teaching (2)**

A study of educational programs and practices in schools with multicultural populations and a focus on becoming a culturally responsive teacher. Clinical experience.

**EDU 331 - Literacy in the Content Area Clinical Experience (1)**

A supervised field-based experience at the secondary 5-12 level with an emphasis on applying literacy strategies appropriate for the various subject matter disciplines. Open to secondary education and all-grade education majors only. Co-requisite: EDU 332

Corequisite: EDU 332.

**EDU 332 - Literacy in the Content Area (2)**

A study of content area reading at the middle and high school levels. An emphasis on comprehension, study skills, and reading strategies appropriate for the various subject matter disciplines. Open to secondary and all-grade majors only. Prerequisite: EDU 301 and EDU 303; Corequisite: EDU 331

Prerequisite: EDU 301 and EDU 303. Corequisite: EDU 331.

**EDU 342 - The Kindergarten Experience (2)**

A study of developmentally appropriate learning environments and practices for kindergarten teachers and their students. Integrated methods of teaching early and emergent literacy skills, math, social studies, science, art, health, technology, and music are explored in light of the cognitive, emotional, social, and physical development of children between the ages of 4-6 years old. In additional to raising awareness for identifying special needs, multicultural issues within the socio-cultural environment are addressed. Prerequisite: EDU 222

Prerequisite: EDU 222.

**EDU 353 - Children's Literature (3)**

Major emphasis is placed on selection and reading of quality children's literature associated with early childhood, middle childhood, and early adolescent stages of development. Literary genres are studied in relation to their value to children. Ways to best present literature in the classroom are explored, including children's responses to literature. Open to elementary education majors only. Prerequisites: EDU 111

Prerequisite: EDU 111.

**EDU 362 - Classroom Behavior & Environment (2)**

A study of how educators can manage the behavior of learners and organize classrooms to achieve positive outcomes. Clinical experience.

**EDU 372 - Teaching of Literacy (3-6) (2)**

A study of scientifically based reading instruction used to positively impact growth of learners in grades 3-6. Areas of study include essential components of literacy assessment, instruction, intervention, extension, and ongoing progress monitoring that is developmentally appropriate for learners in grades 3-6. No clinical placement. Prerequisite: EDU 303; Corequisite: EDU 445

Prerequisite: EDU 303. Corequisite: EDU 445.

**EDU 382 - Behavioral Analysis of Students with Mild Exceptional Needs (2)**

A study of positive behavioral interventions and supports for students with mild exceptional needs. Clinical experience. Prerequisites: EDU 282, EDU 303

Prerequisite: EDU 282, EDU 303.

**EDU 391 - Independent Study for Franks School of Education (1)**

This 1-3 credit course analyzes selected topics in education. A summative project that synthesizes explored content and includes real life application will be developed and presented by the student. This independent study must be arranged by the FSOE advisor or faculty and approved by the Franks School of Education Dean. Prerequisite: Permission from the FSOE Dean

Prerequisite: Permission from the FSOE Dean.

**EDU 392 - Independent Study for Franks School of Education (2)**

This 1-3 credit course analyzes selected topics in education. A summative project that synthesizes explored content and includes real life application will be developed and presented by the student. This independent study must be arranged by the FSOE advisor or faculty and approved by the Franks School of Education Dean. Prerequisite: Permission from the FSOE Dean

Prerequisite: Permission from the FSOE Dean.

**EDU 393 - Independent Study for Franks School of Education (3)**

This 1-3 credit course analyzes selected topics in education. A summative project that synthesizes explored content and includes real life application will be developed and presented by the student. This independent study must be arranged by the FSOE advisor or faculty and approved by the Franks School of Education Dean. Prerequisite: Permission from the FSOE Dean

Prerequisite: Permission from the FSOE Dean.

**EDU 3100 - Montessori E-I Geometry Curriculum I (0)**

This course is Part I of an introduction to the Montessori methodology for elementary classrooms, specifically focused on mathematics—geometry. This course addresses basic foundations of geometry including the fundamental concepts. Philosophical underpinnings will illuminate how elementary children develop their mathematical minds—the ability to measure and abstract, to reason, to make comparisons and draw conclusions, to think logically and be exact. This course takes place in a clinical lab and hands-on practice with materials is required. Prerequisites: EDU 1100/ EDU 1103 and EDU 1110/ EDU 1113 or permission of the program director

Prerequisite: EDU 1100/EDU 1103 and EDU 1110/EDU 1113 or permission of the program director. Crosslisted as: EDU 3101.

**EDU 3101 - Montessori E-I Geometry Curriculum I (1)**

This course is Part I of an introduction to the Montessori methodology for elementary classrooms, specifically focused on mathematics—geometry. This course addresses basic foundations of geometry including the fundamental concepts. Philosophical underpinnings will illuminate how elementary children develop their mathematical minds—the ability to measure and abstract, to reason, to make comparisons and draw conclusions, to think logically and be exact. This course takes place in a clinical lab and hands-on practice with materials is required. Prerequisites: EDU 1100/EDU 1103 and EDU 1110/EDU 1113 or permission of the program director

Prerequisite: EDU 1100/EDU 1103 and EDU 1110/EDU 1113 or permission of the program director. Crosslisted as: EDU 3100.

**EDU 3110 - Montessori E-I Language Curriculum (3)**

This course is an introduction to the Montessori methodology for elementary classrooms, specifically focused on language—reading, writing, grammar, sentence analysis, word study, spelling, and literature. The course introduces concrete materials and methods for assisting lower elementary children in spoken and written communication, from a developmental approach—all using Montessori hands-on materials. This course takes place in a clinical lab and hands-on practice with materials is required. Prerequisites: EDU 1100/EDU 1103 & EDU 1110/EDU 1113

Prerequisite: EDU 1100/EDU 1103 & EDU 1110/EDU 1113. Crosslisted as: EDU 3113.

**EDU 3113 - Montessori E-I Language Curriculum (3)**

This course is an introduction to the Montessori methodology for elementary classrooms, specifically focused on language—reading, writing, grammar, sentence analysis, word study, spelling, and literature. The course introduces concrete materials and methods for assisting lower elementary children in spoken and written communication, from a developmental approach—all using Montessori hands-on materials. This course takes place in a clinical lab and hands-on practice with materials is required. Prerequisites: EDU 1100/EDU 1103 & EDU 1110/EDU 1113

Prerequisite: EDU 1100/EDU 1103 & EDU 1110/EDU 1113. Crosslisted as: EDU 3110.

**EDU 3120 - Montessori E-I Movement, Art and Music Curriculum I (0)**

This course introduces the basics of movement / physical education for the Montessori elementary class. The course offers theory and hands-on instruction and proposes strategies and methods for integrating movement into the experience of Montessori lower elementary children. This course is followed by EDU 3140/EDU 3141. Prerequisites: EDU 1100/EDU 1103 and EDU 1110/EDU 1113 or permission of the program director

Prerequisite: EDU 1100/EDU 1103 and EDU 1110/EDU 1113 or permission of the program director. Crosslisted as: EDU 3121.

**EDU 3121 - Montessori E-I Movement, Art and Music Curriculum I (1)**

This course introduces the basics of movement / physical education for the Montessori elementary class. The course offers theory and hands-on instruction and proposes strategies and methods for integrating movement into the experience of Montessori lower elementary children. This course is followed by EDU 3140/EDU 3141. Prerequisites: EDU 1100/EDU 1103 and EDU 1110/EDU 1113 or permission of the program director

Prerequisite: EDU 1100/EDU 1103 and EDU 1110/EDU 1113 or permission of the program director. Crosslisted as: EDU 3120.

**EDU 3130 - Montessori E-I Geometry Curriculum II (0)**

This course is Part II of an introduction to the Montessori methodology for elementary classrooms, specifically focused on mathematics—geometry. This course addresses basic foundations of geometry including lines, angles, triangles, quadrilaterals, polygons, circles, and an introduction to area—also using Montessori hands-on materials for learning. This course takes place in a clinical lab and hands-on practice with materials is required. Prerequistes: EDU 1100/EDU 1103, EDU 1110/EDU 1113,

and EDU 3100/EDU 3101 or permission of the program director

Prerequisite: EDU 1100/1103, EDU 1110/ EDU 1113, and EDU 3100/ EDU 3101 or permission of the program director. Crosslisted as: EDU 3131.

**EDU 3131 - Montessori E-I Geometry Curriculum II (1)**

This course is Part II of an introduction to the Montessori methodology for elementary classrooms, specifically focused on mathematics—geometry. This course addresses basic foundations of geometry including lines, angles, triangles, quadrilaterals, polygons, circles, and an introduction to area—also using Montessori hands-on materials for learning. This course takes place in a clinical lab and hands-on practice with materials is required. Prerequisites: EDU 1100/EDU 1103, EDU 1110/EDU 1113,and EDU 3100/EDU 3101 or permission of the program director

Prerequisite: EDU 1100/EDU 1103, EDU 1110/EDU 1113,and EDU 3100/EDU 3101 or permission of the program director. Crosslisted as: EDU 3130.

**EDU 3140 - Montessori E-I Movement, Art and Music Curriculum II (0)**

This course continues with the basics of integrated arts including visual art, music, drama, and dance. The course offers theory and hands-on instruction and proposes strategies and method for integrating the arts and movement into the experience of Montessori lower elementary children. Prerequisite: EDU 1100/EDU 1103, EDU 1110/EDU 1113 and EDU 3120/EDU 3121 or permission of the program director

Prerequisite: Prerequisite: EDU 1100/EDU 1103, EDU 1110/EDU 1113 and EDU 3120/EDU 3121 or permission of the program director. Crosslisted as: EDU 3141.

**EDU 3141 - Montessori E-I Movement, Art and Music Curriculum II (1)**

This course continues with the basics of integrated arts including visual art, music, drama, and dance. The course offers theory and hands-on instruction and proposes strategies and methods for integrating the arts and movement into the experience of Montessori lower elementary children. Prerequisites: EDU 1100/EDU 1103, EDU 1110/EDU 1113 and EDU 3120/EDU 3121 or permission of the program director

Prerequisite: EDU 1100/EDU 1103, EDU 1110/EDU 1113 and EDU 3120/EDU 3121 or permission of the program director. Crosslisted as: EDU 3140.

**EDU 3210 - Montessori E I-II Language Curriculum (0)**

This course is a continuation of the Montessori methodology for elementary classrooms, following Montessori E-I Language, specifically focused on language for the upper elementary classroom—reading, writing, grammar, sentence analysis, word study, spelling, and literature. The course introduces concrete materials and methods for assisting upper elementary children in spoken and written communication, from a developmental approach—all using Montessori hands-on materials. This course takes place in a clinical lab and hands-on practice with materials is required.

Prerequisite: Admission to the E I-II program.

**EDU 3220 - Montessori E I-II Movement, Art, & Music (1)**

This course introduces the basics of movement / physical education for the Montessori upper elementary class (children ages 9-12). The course offers theory and hands-on instruction and proposes strategies and methods for integrating movement into the experience of Montessori upper elementary children.

Prerequisite: Admission to the E I-II program.

**EDU 411 - Practicum in Teaching - Middle School (1)**

A supervised field-based experience at the middle school (5-8) level, with an emphasis on effective teaching methods and the philosophy of education. Prerequisites: EDU 422, Admission to Professional Education Sequence

Prerequisite: EDU 422, Admission to Professional Education Sequence.

**EDU 412 - The Middle School (2)**

A study of the historical and philosophical origins of the middle school. The changing cognitive, physical, social and emotional needs of the middle level learner are examined; team teaching, exploratory, advisor-advisee, intramural activities; scheduling; teacher qualities; parent expectations are examined. Prerequisites: EDU 301, EDU 303

Prerequisite: EDU 301, EDU 303.

**EDU 422 - Middle School Methods (2)**

A study of instruction and techniques for successful teaching of middle-level students. Emphasis on planning, application, team teaching, interdisciplinary teaching, interrelationship of subject matter. Clinical experience. Prerequisite: EDU 412

Prerequisite: EDU 412.

**EDU 431 - Secondary Methods Practicum (1)**

A supervised field-based experience at the secondary (9-12) level, with an emphasis on effective teaching methods and the philosophy of education. Open to secondary and all-grade majors only. Prerequisite: EDU 301, EDU 303, and content area approval

Prerequisite: EDU 301, EDU 303, and content area approval .

**EDU 432 - Arts for the Elementary Teacher (2)**

A study of how physical movement, music, and art can be incorporated within general elementary classroom instruction to enhance whole child development. An emphasis on methodology to integrate arts within the standards-based scope and sequence of K-6 curriculum. Field experience included. Corequisites: EDU 454 and EDU 464; Prerequisites: EDU 301 and EDU 303

Prerequisite: EDU 301 Instructional Design Practicum and EDU 303 Instructional Design. Corequisite: EDU 454 Methods of Teaching Mathematics & Science and EDU 464 Methods of Teaching Language Arts & Social Studies.

**EDU 441 - Teaching of Literacy Practicum (1)**

An in-depth study of the responsibilities of teaching reading in an elementary setting. Clinical experience. Open to elementary majors only. Corequisite: EDU 445

Corequisite: EDU 445.

**EDU 442 - Secondary Methods (2)**

A study of teaching methods designed to facilitate competency in specific subject areas; methods, daily and long-range planning, classroom management, instructional technology, curriculum development, secondary school organization, individualized instruction, motivation, concept development, and interdisciplinary teaching. Open to secondary and all-grade majors only. Clinical experience. Corequisite: EDU 431

Corequisite: EDU 431.

**EDU 445 - Teaching of Literacy (K-2) (5)**

A study of multiple approaches used in the teaching of reading including balanced reading programs, phonics, and literature-based programs. A study of reading methods, strategies, and techniques designed to help children who are experiencing difficulties learning to read. Open to elementary majors only. Prerequisite: EDU 301, EDU 303; Corequisite: EDU 441

Prerequisite: EDU 301, EDU 303. Corequisite: EDU 441.

**EDU 450 - Elementary Methods Block Practicum (0)**

A supervised K-6 clinical experience with an emphasis on applying evidence-based instructional strategies across general education subject disciplines. Corequisites: EDU 454 and EDU 464; Prerequisites: EDU 301 and 303

Prerequisite: EDU 301 Instructional Design Practicum and EDU 303 Instructional Design. Corequisite: EDU 454 Methods of Teaching Mathematics & Science  EDU 464 Methods of Teaching Language Arts & Social Studies.

**EDU 452 - Art for the Elementary Teacher (2)**

A study of discipline-based art education as it applies to the elementary classroom. Emphasis on the preparation of art projects and the use of art as a tool of learning using a variety of mediums and materials. Open to elementary majors only. Clinical experience. Prerequisite: EDU 301, EDU 303

Prerequisite: EDU 301, EDU 303 .

**EDU 454 - Methods of Teaching Mathematics & Science (4)**

A study of methodologies, techniques, and materials used in the teaching of mathematics and science at the K-6 level. Emphasis is on hands-on science and the use of math manipulatives. National and state curriculum standards specific to teaching mathematics and science are examined and included as critical components of effective lesson/unit planning. Open to elementary majors only. Clinical experience. Prerequisite: EDU 301 and EDU 303

Prerequisite: EDU 301 and EDU 303.

**EDU 461 - Online & Blended Learning (1)**

A study of methods and responsibilities of teaching in online and blended classrooms, including best practices for creating an engaging, safe, inclusive, and effective digital learning environment. Virtual field experience required. Corequisite: EDU 463; Prerequisites: EDU 301 and EDU 303

Prerequisite: EDU 301 Instructional Design Practicum and EDU 303 Instructional Design. Corequisite: EDU 463 Educational Media And Technology.

**EDU 462 - Educational Measurement (2)**

A study of methods of assessment and evaluation that include standardized tests, teacher-made tests, authentic assessment, rubrics, portfolios, performance assessment, informal assessment. Prerequisite: EDU 301, EDU 303

Prerequisite: EDU 301, EDU 303.

**EDU 463 - Educational Media And Technology (3)**

A study of instructional media and technology used in K-12 settings. Prerequisite: EDU 301, EDU 303

Prerequisite: EDU 301, EDU 303.

**EDU 464 - Methods of Teaching Language Arts & Social Studies (4)**

A study of methodologies, techniques, technology, and curricular resources used in the teaching of language arts and social studies at the K-6 level. National and state curriculum standards specific to teaching social studies and oral/written expression in language arts are examined and included as critical components of effective lesson/unit planning. Clinical experience. Open to elementary majors only. Prerequisite: EDU 301 and EDU 303

Prerequisite: EDU 301 and EDU 303.

**EDU 470 - Supervised Student Teaching (10)**

Observation, participation, and teaching in a school under the direction of a master cooperating teacher and university supervisor. Candidate is assigned to an area school for 16 full weeks according to subject matter and grade level of planned

certification. Prerequisites: senior status; 3.0 GPA in major, overall; Corequisite: EDU 482

Prerequisite: Senior status; 3.0 GPA in major, overall. Corequisite: EDU 482.

**EDU 473 - Issues in American Public Education (3)**

A study of the historical, philosophical, and social aspects of American public education. The legal and financial basis of public education and the rights and responsibilities of teachers and students are reviewed. Significant professional issues are identified and explored.

Prerequisite: EDU 301 and EDU 303.

**EDU 480 - Special Education Methods Practicum (0)**

A supervised P-12 clinical experience with an emphasis on applying evidence-based instructional strategies for special education mild intervention learners. Corequisite: EDU 484; Prerequisites: EDU 303 and 301

Prerequisite: EDU 301 Instructional Design Practicum and EDU 303 Instructional Design. Corequisite: EDU 484 Methods of Teaching Students with Mild Exceptional Needs.

**EDU 482 - Student Teaching Seminar (2)**

Analysis, synthesis, and reflection based on the student teaching experience. Prerequisites: senior standing; 3.0 GPA in major, overall; Corequisite: EDU 470

Prerequisite: Senior standing; 3.0 GPA in major, overall. Corequisite: EDU 470.

**EDU 483 - Individualized Planning & Assessment of Students with Mild Exceptional Needs (3)**

A study of formal and informal assessments used in the field of special education. Examination includes the development, implementation, monitoring, and amending of individualized programs for students with mild exceptional needs. Clinical experience. Prerequisites: EDU 382

Prerequisite: EDU 382.

**EDU 484 - Methods of Teaching Students with Mild Exceptional Needs (4)**

A study of methodologies, techniques, technology, materials, and curricular resources used in teaching students with mild exceptional needs. Experiences will include planning, managing, and modifying learning environments and applying strategies that develop students' curriculum, communication, and social skills. Clinical experience. Prerequisites: EDU 483

Prerequisite: EDU 483.

**EDU 4001 - Directed Studies In Education (1)**

Individual projects, research, and/or directed studies of contemporary issues in the field of professional education. Credit arranged on an individual basis. Prerequisite: Approval of the Dean of the Franks School of Education

Prerequisite: Approval of the Dean of the Franks School of Education.

**EDU 4002 - Directed Studies In Education (2)**

Individual projects, research, and/or directed studies of contemporary issues in the field of professional education. Credit arranged on an individual basis. Prerequisite: Approval of the Dean of the Franks School of Education

Prerequisite: Approval of the Dean of the Franks School of Education.

**EDU 4003 - Directed Studies In Education (3)**

Individual projects, research, and/or directed studies of contemporary issues in the field of professional education. Credit arranged on an individual basis. Prerequisite: Approval of the Dean of the Franks School of Education

Prerequisite: Approval of the Dean of the Franks School of Education.

**EDU 4004 - Directed Studies In Education (4)**

Individual projects, research, and/or directed studies of contemporary issues in the field of professional education. Credit arranged on an individual basis. Prerequisite: Approval of the Dean of the Franks School of Education

Prerequisite: Approval of the Dean of the Franks School of Education.

**EDU 4005 - Directed Studies In Education (5)**

Individual projects, research, and/or directed studies of contemporary issues in the field of professional education. Credit arranged on an individual basis. Prerequisite: Approval of the Dean of the Franks School of Education

Prerequisite: Approval of the Dean of the Franks School of Education.

**EDU 4100 - Montessori E-I Curriculum Design/Classroom Leadership I (0)**

This course introduces the basics of Montessori program, curriculum and environmental design for the lower elementary (6-9) classroom and the requirements of the teacher/guide for leading effective learning and engagement among students, scheduling, planning, record keeping, assessment, community building and family involvement, conflict resolution, cultural awareness and inclusion, and peaceful interactions. This course is followed by EDU 4160/EDU 4161. Prerequisites: EDU 1100/EDU 1103 and EDU 1110/EDU 1113 or permission of the program director

Prerequisite: EDU 1100/EDU 1103 and EDU 1110/EDU 1113 or permission of the program director. Crosslisted as: EDU 4101.

**EDU 4101 - Montessori E-I Curriculum Design/Classroom Leadership I (1)**

This course introduces the basics of Montessori program, curriculum and environmental design for the lower elementary (6-9) classroom and the requirements of the teacher/guide for leading effective learning and engagement among students, scheduling, planning, record keeping, assessment, community building and family involvement, conflict resolution, cultural awareness and inclusion, and peaceful interactions. This course is followed by EDU 4160/EDU 4161. Prerequisites: EDU 1100/EDU 1103 and EDU 1110/EDU 1113 or permission of the program director

Prerequisite: EDU 1100/EDU 1103 and EDU 1110/EDU 1113 or permission of the program director. Crosslisted as: EDU 4100.

**EDU 4103 - Education Studies Internship (3)**

This course provides senior-level education students with immersive capstone experience in a setting aligned to their career path. An application of theory and implementation of educational strategies are required. This internship must be arranged by the FSOE advisor or faculty and approved by the Franks School of Education Dean. Prerequisite: Senior-level Education Studies majors

Prerequisite: Senior-level Education Studies majors.

**EDU 4110 - Montessori E-I Practical Life Curriculum (0)**

This course addresses the basics of activities for practical living within a Montessori lower elementary classroom. Topics include self-care, hygiene, health, safety, care of the environment, gardening, food preparation, information technology and media, maker activities and spaces, handwork—particularly as it applies to cultural studies, and care of classroom/school pets. Prerequisite: EDU 1100/EDU 1103 and EDU 1110/EDU 1113

Prerequisite: EDU 1100/EDU 1103 & EDU 1110/EDU 1113. Crosslisted as: EDU 4112.

**EDU 4112 - Montessori E-I Practical Life Curriculum (2)**

This course addresses the basics of activities for practical living within a Montessori lower elementary classroom. Topics include self-care, hygiene, health, safety, care of the environment, gardening, food preparation, information technology and

media, maker activities and spaces, handwork—particularly as it applies to cultural studies, and care of classroom/school pets. Prerequisite: EDU 1100/EDU 1103 and EDU 1110/EDU 1113

Prerequisite: EDU 1100/EDU 1103 & EDU 1110/EDU 1113. Crosslisted as: EDU 4110.

**EDU 4120 - Montessori E-I Practicum Teaching I (0)**

This represents the first practicum (student teaching) component of the Montessori Elementary I Education Program. Practicum students will observe, participate, and teach in a Montessori setting under the guidance of a university supervisor. Complete details of this component are found in the Practicum Handbook. Prerequisite: Summer academic phase of coursework in Montessori E-I education or permission of the program director.

Prerequisite: Summer academic phase of coursework in Montessori E-I education or permission of the program director. Crosslisted as: EDU 4123.

**EDU 4123 - Montessori E-I Practicum Teaching I (3)**

This represents the first practicum (student teaching) component of the Montessori Elementary I Education Program. Practicum students will observe, participate, and teach in a Montessori setting under the guidance of a university supervisor. Complete details of this component are found in the Practicum Handbook. Prerequisite: Summer academic phase of coursework in Montessori E-I education or permission of the program director

Prerequisite: Summer academic phase of coursework in Montessori E-I education or permission of the program director. Crosslisted as: EDU 4120.

**EDU 4130 - Montessori E-I Practicum Seminar I (0)**

This online semester course provides guided support, additional content, and systematic practice with the Montessori materials. Students begin a year-long project and have a mechanism to complete and submit independent work based on the previous summer academic phase, during the Practicum year. Students will register for this course in fall. Class will meet synchronously once per week in an online format. Prerequisites: EDU 1100/EDU 1103, EDU 1110/EDU 1113 or permission of the program director

Prerequisite: EDU 1100/EDU 1103, EDU 1110/EDU 1113 or permission of the program director. Crosslisted as: EDU 4132.

**EDU 4132 - Montessori E-I Practicum Seminar I (2)**

This online semester course provides guided support, additional content, and systematic practice with the Montessori materials. Students begin a year-long project and have a mechanism to complete and submit independent work based on the previous summer academic phase, during the Practicum year. Students will register for this course in fall. Class will meet synchronously once per week in an online format. Prerequisites: EDU 1100/EDU 1103, EDU 1110/EDU 1113 or permission of the program director

Prerequisite: EDU 1100/EDU 1103, EDU 1110/EDU 1113 or permission of the program director. Crosslisted as: EDU 4130.

**EDU 4140 - Montessori E-I Practicum Teaching II (0)**

This represents the second practicum (student teaching) component of the Montessori Elementary I Education Program. Practicum students will observe, participate, and teach in a Montessori setting under the guidance of a university supervisor. Complete details of this component are found in the Practicum Handbook. Prerequisite: EDU 4120/EDU 4123 or permission of the program director

Prerequisite: EDU 4120/EDU 4123 or permission of the program director. Crosslisted as: EDU 4143.

**EDU 4143 - Montessori E-I Practicum Teaching II (3)**

This represents the second practicum (student teaching) component of the Montessori Elementary I Education Program.

Practicum students will observe, participate, and teach in a Montessori setting under the guidance of a university supervisor. Complete details of this component are found in the Practicum Handbook. Prerequisite: EDU 4120/EDU 4123 or permission of the program director

Prerequisite: EDU 4120/EDU 4123 or permission of the program director. Crosslisted as: EDU 4140.

**EDU 4150 - Montessori E-I Practicum Seminar II (0)**

This online semester course provides guided support, additional content, and systematic practice with the Montessori materials. Students complete a year-long project, and have a mechanism to complete and submit independent work based on the previous summer academic phase, during the practicum year. Students will register for this course in the spring semester. Class will meet synchronously once per week in an online format. Prerequisites: EDU 1100/EDU 1103, EDU 1110/EDU 1113 or permission of the program director

Prerequisite: EDU 1100/EDU 1103, EDU 1110/EDU 1113 or permission of the program director. Crosslisted as: EDU 4152.

**EDU 4152 - Montessori E-I Practicum Seminar II (2)**

This online semester course provides guided support, additional content, and systematic practice with the Montessori materials. Students complete a year-long project, and have a mechanism to complete and submit independent work based on the previous summer academic phase, during the practicum year. Students will register for this course in the spring semester. Class will meet synchronously once per week in an online format. Prerequisite: EDU 1100/EDU 1103, EDU 1110/EDU 1113 or permission of the program director

Prerequisite: EDU 1100/EDU 1103, EDU 1110/EDU 1113 or permission of the program director. Crosslisted as: EDU 4150.

**EDU 4160 - Montessori E-I Curriculum Design/Classroom Leadership II (0)**

This course continues with the basics of Montessori program, curriculum and environmental design for the lower elementary (6-9) classroom and the requirements of the teacher/guide for leading effective learning and engagement among students, scheduling, planning, record keeping, assessment, community building and family involvement, conflict resolution, cultural awareness and inclusion, and peaceful interactions. Prerequisite: EDU 1100/EDU 1103, EDU 1110/EDU 1113, and EDU 4100/EDU 4101or permission of the program director

Prerequisite: EDU 1100/EDU 1103, EDU 1110/EDU 1113, and EDU 4100/EDU 4101 or permission of the program director. Crosslisted as: EDU 4161.

**EDU 4161 - Montessori E-I Curriculum Design/Classroom Leadership II (1)**

This course continues with the basics of Montessori program, curriculum and environmental design for the lower elementary (6-9) classroom and the requirements of the teacher/guide for leading effective learning and engagement among students, scheduling, planning, record keeping, assessment, community building and family involvement, conflict resolution, cultural awareness and inclusion, and peaceful interactions. Prerequisites: EDU 1100/EDU 1103, EDU 1110/EDU 1113 and EDU 4100/EDU 4101 or permission of the program director

Prerequisite: EDU 1100/1103, EDU 1110/1113 and EDU 4100/4101 or permission of the program director. Crosslisted as: EDU 4160.

**EDU 4200 - Montessori E I-II Curriculum Design and Classroom Leadership I (0)**

This course continues from Montessori E-I Curriculum Design and Classroom Leadership, and introduces the basics of Montessori program, curriculum and environmental design for the upper elementary (ages 9-12) classroom and the requirements of the teacher/guide for leading effective learning and engagement among students, scheduling, planning, record keeping, assessment, community building and family involvement, conflict resolution, cultural awareness and inclusion, and peaceful interactions.

Prerequisite: Admission to the E I-II program.

**EDU 4210 - Montessori E I-II Practical Life Curriculum (0)**

This course provides instruction on the curriculum for Practical Life Curriculum for a Montessori 9-12 classroom. The content includes developmentally appropriate aspects of everyday living for children ages 9-12 including healthy life choices, grace and courtesy practices, use of technology, and age-appropriate hands-on practical work.

Prerequisite: Admission to the E I-II program.

**EDU 4220 - Montessori E I-II Curriculum Design and Classroom Leadership II (0)**

This course continues from Montessori E-I Curriculum Design and Classroom Leadership, and introduces the basics of Montessori program, curriculum and environmental design for the upper elementary (ages 9-12) classroom and the requirements of the teacher/guide for leading effective learning and engagement among students, scheduling, planning, record keeping, assessment, community building and family involvement, conflict resolution, cultural awareness and inclusion, and peaceful interactions. This course runs synchronously in a distance learning environment.

Prerequisite: Admission to the E I-II program.

**EDU 4230 - Montessori E I-II Practicum Seminar I (0)**

This online semester course provides guided support, additional content, systematic practice with the Montessori materials, a year-long project, and a mechanism to complete and submit independent work based on the previous summer academic phase, during the Practicum year. Students will register for this course in fall and spring semesters following the summer E I-II academic phase. Classes will meet synchronously once per week from September to December, in an online format.

Prerequisite: Montessori E I-II Academic Phase.

**EDU 4250 - Montessori E I-II Practicum Seminar II (0)**

This online semester course provides guided support, additional content, systematic practice with the Montessori materials, a year-long project, and a mechanism to complete and submit independent work based on the previous summer academic phase, during the Practicum year. Students will register for this course in fall and spring semesters following the summer E I-II academic phase. Classes will meet synchronously once per week from September to December, in an online format.

Prerequisite: Montessori E I-II Academic Phase.

**EDU 5012 - Montessori Philosophy/Theory/Peace Education (2)**
**EDU 5013 - Montessori Cultural Studies Curriculum (Physical/Life Science and Social Studies Curriculum) (3)**
**EDU 5022 - Montessori Practical Life/Everyday Living Curriculum (2)**
**EDU 5023 - Montessori Art, Music & Movement Curriculum (3)**
**EDU 5032 - Montessori Sensorial Curriculum (2)**
**EDU 5033 - Montessori Classroom Leadership (3)**
**EDU 5042 - Montessori Language Curriculum (2)**
**EDU 5043 - Montessori Early Childhood Practicum Teaching I (3)**
**EDU 5052 - Montessori Math Curriculum (2)**
**EDU 5053 - Montessori Early Childhood Practicum Teaching II (3)**
**EDU 5062 - Montessori Child Development/Psychology (2)**
**EDU 5072 - Montessori Early Childhood Practicum Seminar I (2)**
**EDU 5082 - Montessori Early Childhood Practicum Seminar II (2)**
**EDU 5101 - The Beginning Teacher (1)**

A study of the foundations for creating an inclusive and effective learning environment that ensures academic and social success for all learners. Clinical placement required.

**EDU 5103 - Literacy for the Elementary Teacher I (3)**

A study of scientifically based reading instruction used to positively impact growth of learners in grades K-6. Areas of study include essential components of literacy assessment, instruction, intervention, extension, and ongoing progress monitoring that

is developmentally appropriate for learners in grades K-6. Clinical placement required.

**EDU 5112 - The Assessment Cycle I (2)**

A study of the foundations of an inclusive and successful assessment cycle that ensures success for all learners through lesson planning, differentiated instruction, and the design and use of summative and formative assessments in a recursive cycle. Clinical placement required.

**EDU 5113 - Literacy for the Elementary Teacher II (3)**

A study of multiple approaches used in the teaching of reading including balanced reading programs, phonics, and literature-based programs. A study of reading methods, strategies, and techniques designed to help children who are experiencing difficulties learning to read. Clinical placement required.

**EDU 5122 - Partnering with Families (2)**

A study of the importance of welcoming, positive, and supportive partnerships with learners' families and the development of the tools to facilitate those partnerships. Clinical placement required.

**EDU 5132 - Expanding the Classroom with Technology (2)**

A study of the effective use of technology to support an inclusive classroom. Clinical placement required.

**EDU 5142 - The Reflective Teacher (2)**

An analysis of the implementation of the teacher candidate's learning environment in producing an inclusive and effective environment for learners and families including the assessment cycle, reading instruction, and the use of technology. Clinical placement required.

**EDU 5152 - The Classroom Environment (2)**

An advanced study and analysis of the foundations for creating an inclusive and effective learning environment that ensures academic and social success for all learners. Clinical placement required.

**EDU 5162 - Deeper Learning Instructional Strategies (2)**

An advanced study and analysis of instructional strategies for creating inclusive and effective learning opportunities that ensure success and deeper understanding for all students. Clinical placement required.

**EDU 5172 - The Assessment Cycle II (2)**

An advanced study and analysis of an inclusive and effective assessment cycle that ensures success for all students through lesson planning, differentiated instruction, and the design and use of summative and formative assessments in a recursive cycle. Clinical placement required.

**EDU 5182 - Taking the Lead (2)**

An advanced study of designing and leading professional development for education professionals. Clinical placement required.

**EDU 5191 - Professional Goal Setting (1)**

An advanced analysis of the teacher candidate's effectiveness in producing an inclusive and effective environment for learners and families including the assessment cycle, reading instruction, and the use of technology, as well as its impact on learners. Clinical placement required.

**EDU 5213 - How We Relate: The Connections of Educator and Learner Ecosystems (3)**

A study and construction of a portrait of an educator through the identification and synthesis of teacher, learners, and family attributes to better understand systems including place, community, culture, development, and learning. Prerequisite: EDU 5191

Prerequisite: Edu 5191.

**EDU 5223 - How We Interact: The Connections of Learning and Sharing Information (3)**

A study and construction of a portrait of a graduate through the identification and synthesis of how the neuroscience of thinking and emotions impact motivations for learning and decision-making. Analysis will include the understanding of the interrelatedness of critical and creative thinking, the impact of emotions, effective communication, effective collaboration, and the development of shared purpose so learners can optimize learning to solve relevant problems. Prerequisite: EDU 5213

Prerequisite: EDU 5213.

**EDU 5233 - How We Assess: The Connections of Learning to Life (3)**

A study of developing assessments that reflect depth of knowledge, embed cross-curricular applications, and solve community problems to effectively show learning. Analysis will include the understanding of how to construct effective assessments that have an equity focus, empower learners to demonstrate their knowledge, and contribute to their communities. Prerequisites: EDU 5213 and EDU 5223

Prerequisite: EDU 5213 and EDU 5223.

**EDU 5243 - How We Improve: The Connections of Research and Practice (3)**

A study of the qualities of qualitative and quantitative education research. Analysis will include an understanding of research design and the implementation of action research within the context of the school community.

**EDU 5333 - Research Methods (3)**
**EDU 5601 - Montessori E-I Movement, Art and Music Curriculum I (1)**

This course introduces the basics of movement / physical education for the Montessori elementary class. The course offers theory and hands-on instruction and proposes strategies and methods for integrating movement into the experience of Montessori lower elementary children. This course is followed by EDU 5611. Prerequisites: EDU 5603 and EDU 5613 or permission of the program director

Prerequisite: EDU 5603 and EDU 5613 or permission of the program director.

**EDU 5603 - Montessori E-I EC Overview (3)**

This course is a comprehensive introduction to child development and the Montessori philosophy/theory, methodology, and materials usage in the Montessori Early Childhood environments, that is intended to provide background and preparation for lower elementary teacher candidates pursuing Montessori qualifications to teach in Montessori lower elementary classrooms. The course is specifically focused on coverage of Montessori theories of child development, preparation of the environment and adult, classic materials and methodologies, and significant presentations that are precursors to the Elementary I curriculum.

**EDU 5611 - Montessori E-I Movement, Art and Music Curriculum II (1)**

This course continues with the basics of integrated arts including visual art, music, drama, and dance. The course offers theory and hands-on instruction and proposes strategies and methods for integrating the arts and movement into the experience of Montessori lower elementary children. Prerequisites: EDU 5601, EDU 5603, and EDU 5613 or permission of the program director.

Prerequisite: EDU 5601, EDU 5603, and EDU 5613 or permission of the program director.

**EDU 5613 - Montessori E-I Philosophy/Child Development (3)**

This course addresses the characteristics and physical, cognitive, and social-emotional development of children ages 6-12 years old as well as introducing the philosophical underpinnings of the Montessori lower elementary educational methodology and philosophy as it applies to children of this age range. The course includes topics such as preparation of the teacher and environment for learning, integrated curriculum, Montessori's vision of "cosmic education," peace education, classroom/student observation strategies and practices, and methods for encouraging student autonomy and independence. This

course is a blended online and in-person course.

**EDU 5621 - Montessori E-I Curriculum Design/Classroom Leadership I (1)**

This course introduces the basics of Montessori program, curriculum and environmental design for the lower elementary (6-9) classroom and the requirements of the teacher/guide for leading effective learning and engagement among students, scheduling, planning, record keeping, assessment, community building and family involvement, conflict resolution, cultural awareness and inclusion, and peaceful interactions. This course is followed by EDU 5631. Prerequisites: EDU 5603 and EDU 5613 or permission of the program director

Prerequisite: EDU 5603 and EDU 5613 or permission of the program director.

**EDU 5622 - Montessori E-I Practical Life Curriculum (2)**

This course addresses the basics of activities for practical living within a Montessori lower elementary classroom. Topics include self-care, hygiene, health, safety, care of the environment, gardening, food preparation, information technology and media, maker activities and spaces, handwork—particularly as it applies to cultural studies, and care of classroom/school pets. Prerequisites: EDU 5603, EDU 5613 or permission of the program director

Prerequisite: EDU 5603, EDU 5613 or permission of the program director.

**EDU 5623 - Montessori E-I Cultural Geography Curriculum (3)**

This course is an introduction to the hands-on materials and methodology for lower elementary traditional and Montessori classrooms, specifically focused on coverage of integrated cultural curriculum, including introductory work in history; human, physical, and political geography; biology; and physical science. The course addresses content topics of human geography and world cultures, human habitation, migration, and the interface between humans, their environments, and the idea of dwelling. Emphasis is on the methods, materials, and philosophical underpinnings of the cultural subjects through a holistic and integrated approach. This course takes place in a clinical lab and hands-on practice with materials is required. Prerequisites: EDU 5603, EDU 5613 or permission of the program director

Prerequisite: EDU 5603, EDU 5613 or permission of the program director.

**EDU 5631 - Montessori E-I Curriculum Design/Classroom Leadership II (1)**

This course continues with the basics of Montessori program, curriculum and environmental design for the lower elementary (6-9) classroom and the requirements of the teacher/guide for leading effective learning and engagement among students, scheduling, planning, record keeping, assessment, community building and family involvement, conflict resolution, cultural awareness and inclusion, and peaceful interactions. Prerequisites: EDU 5621, EDU 5603, and EDU 5613 or permission of the program director

Prerequisite: EDU 5621, EDU 5603, and EDU 5613 or permission of the program director.

**EDU 5632 - Montessori E-I Practicum Seminar I (2)**

This online semester course provides guided support, additional content, and systematic practice with the Montessori materials. Students begin a year-long project and have a mechanism to complete and submit independent work based on the previous summer academic phase, during the Practicum year. Students will register for this course in fall. Class will meet synchronously once per week in an online format.  Prerequisites: EDU 5603, EDU 5613 or permission of the program director

Prerequisite: EDU 5603, EDU 5613 or permission of the program director.

**EDU 5633 - Montessori E-I Mathematics Curriculum (3)**

This course is an introduction to the Montessori methodology for elementary classrooms, specifically focused on mathematics—arithmetic. The course introduces concrete materials and methods for assisting lower elementary children in arithmetic, from developing a grasp of basic numeration through advanced levels of the four operations, memorization of mathematic facts, and beginning fractions—all using Montessori hands-on materials. Philosophical underpinnings will illuminate how elementary children develop their mathematical minds—the ability to measure and abstract, to reason, to make

comparisons and draw conclusions, to think logically and be exact. This course takes place in a clinical lab and hands-on practice with materials is required. Prerequisites: EDU 5603, EDU 5613 or permission of the program director.

Prerequisite: EDU 5603, EDU 5613 or permission of the program director.

**EDU 5641 - Montessori E-I Geometry Curriculum I (1)**

This course is Part I of an introduction to the Montessori methodology for elementary classrooms, specifically focused on mathematics—geometry. This course addresses basic foundations of geometry including the fundamental concepts. Philosophical underpinnings will illuminate how elementary children develop their mathematical minds—the ability to measure and abstract, to reason, to make comparisons and draw conclusions, to think logically and be exact. This course takes place in a clinical lab and hands-on practice with materials is required. Prerequisites: EDU 5603 and EDU 5613 or permission of the program director

Prerequisite: EDU 5603 and EDU 5613 or permission of the program director.

**EDU 5642 - Montessori E-I Practicum Seminar II (2)**

This online semester course provides guided support, additional content, and systematic practice with the Montessori materials. Students complete a year-long project, and have a mechanism to complete and submit independent work based on the previous summer academic phase, during the practicum year. Students will register for this course in the spring semester. Class will meet synchronously once per week in an online format. Prerequisite: EDU 5603, EDU 5613 or permission of the program director

Prerequisite: EDU 5603, EDU 5613 or permission of the program director.

**EDU 5651 - Montessori E-I Geometry Curriculum II (1)**

This course is Part II of an introduction to the Montessori methodology for elementary classrooms, specifically focused on mathematics—geometry. This course addresses basic foundations of geometry including lines, angles, triangles, quadrilaterals, polygons, circles, and an introduction to area—also using Montessori hands-on materials for learning. This course takes place in a clinical lab and hands-on practice with materials is required. Prerequisites: EDU 5603, EDU 5613, and EDU 5641 or permission of the program director

Prerequisite: EDU 5603, EDU 5613, and EDU 5641 or permission of the program director.

**EDU 5653 - Montessori E-I Language Curriculum (3)**

This course is an introduction to the Montessori methodology for elementary classrooms, specifically focused on language—reading, writing, grammar, sentence analysis, word study, spelling, and literature. The course introduces concrete materials and methods for assisting lower elementary children in spoken and written communication, from a developmental approach—all using Montessori hands-on materials. This course takes place in a clinical lab and hands-on practice with materials is required. Prerequisites: EDU 5603, EDU 5613 or permission of the program director.

Prerequisite: EDU 5603, EDU 5613 or permission of the program director.

**EDU 5663 - Montessori E-I Practicum Teaching I (3)**

This represents the first practicum (student teaching) component of the Montessori Elementary I Education Program. Practicum students will observe, participate, and teach in a Montessori setting under the guidance of a university supervisor. Complete details of this component are found in the Practicum Handbook. Prerequisite: Summer academic phase of coursework in Montessori E-I education or permission of the program director.

Prerequisite: Summer academic phase of coursework in Montessori E-I education or permission of the program director.

**EDU 5673 - Montessori E-I Practicum Teaching II (3)**

This represents the second practicum (student teaching) component of the Montessori Elementary I Education Program. Practicum students will observe, participate, and teach in a Montessori setting under the guidance of a university

supervisor.  Complete details of this component are found in the Practicum Handbook. Prerequisite: EDU 5663 or permission of the program director

Prerequisite: EDU 5663 or permission of the program director.

**EDU 5701 - Montessori E I-II Curriculum Design and Classroom Leadership I (1)**

This course continues from Montessori E-I Curriculum Design and Classroom Leadership, and introduces the basics of Montessori program, curriculum and environmental design for the upper elementary (ages 9-12) classroom and the requirements of the teacher/guide for leading effective learning and engagement among students, scheduling, planning, record keeping, assessment, community building and family involvement, conflict resolution, cultural awareness and inclusion, and peaceful interactions.

Prerequisite: Admission to the E I-II master's program.

**EDU 5704 - Montessori E I-II Mathematics and Geometry Curriculum (4)**

This course is a continuation of the Montessori methodology for Elementary II classrooms, specifically focused on both mathematics and geometry. The course relies on concrete materials and methods for assisting upper elementary children in arithmetic, from developing a grasp of multiples, factors and divisibility through advanced levels of cube roots, decimals, base systems, and statistics—all using Montessori hands-on materials. In geometry students will work with concepts such as equivalence, similarity, congruence, area, and volume–again, using Montessori materials for learning. Philosophical underpinnings will illuminate how elementary children develop their mathematical minds—the ability to measure and abstract, to reason, to make comparisons and draw conclusions, to think logically and be exact.
This course takes place in a clinical lab and hands-on practice with materials is required.

Prerequisite: Admission to the E I-II program.

**EDU 5711 - Montessori E I-II Practical Life Curriculum (1)**

This course provides instruction on the curriculum for Practical Life Curriculum for a Montessori aged 9-12 classroom. The content includes developmentally appropriate aspects of everyday living for children ages 9-12 including healthy life choices, grace and courtesy practices, use of technology, and age-appropriate hands-on practical work.

Prerequisite: Admission to the E I-II master's program.

**EDU 5712 - Montessori E I-II Language Curriculum (2)**

This course is a continuation of the Montessori methodology for elementary classrooms, following Montessori E-I Language, specifically focused on language for the upper elementary classroom—reading, writing, grammar, sentence analysis, word study, spelling, and literature. The course introduces concrete materials and methods for assisting upper elementary children in spoken and written communication, from a developmental approach—all using Montessori hands-on materials. This course takes place in a clinical lab and hands-on practice with materials is required.

Prerequisite: Admission to the E I-II master's program.

**EDU 5713 - Montessori E I-II Cultural Curriculum (3)**

This course gives an advanced view of the cultural subjects for a Montessori upper elementary classroom (students ages 9-12), and includes the academic topics of history, geography, world cultures, and the sciences. This course takes place in a clinical lab and some hands-on practice with materials is required.

Prerequisite: Admission to the E I-II master's program.

**EDU 5721 - Montessori E I-II Movement, Art, & Music (1)**

This course introduces the basics of movement / physical education for the Montessori upper elementary class (children ages 9-12). The course offers theory and hands-on instruction and proposes strategies and methods for integrating movement into the experience of Montessori upper elementary children.

Prerequisite: Admission to the E I-II master's program.

**EDU 5731 - Montessori E I-II Practicum Seminar I (1)**

This online semester course provides guided support, additional content, systematic practice with the Montessori materials, a year-long project, and a mechanism to complete and submit independent work based on the previous summer academic phase, during the Practicum year. Students will register for this course in the fall semester following the summer E I-II academic phase. Classes will meet synchronously once per week from September to December, in an online format.

Prerequisite: Admission to the E I-II master's program.

**EDU 5741 - Montessori E I-II Curriculum Design and Classroom Leadership II (1)**

This course continues from Montessori E-I Curriculum Design and Classroom Leadership, and introduces the basics of Montessori program, curriculum and environmental design for the upper elementary (9-12 year old) classroom and the requirements of the teacher/guide for leading effective learning and engagement among students, scheduling, planning, record keeping, assessment, community building and family involvement, conflict resolution, cultural awareness and inclusion, and peaceful interactions. This course runs synchronously in a distance learning environment.

Prerequisite: Admission to the E I-II master's program.

**EDU 5751 - Montessori E I-II Practicum Seminar II (1)**

This online semester course provides guided support, additional content, systematic practice with the Montessori materials, a year-long project, and a mechanism to complete and submit independent work based on the previous summer academic phase, during the Practicum year. Students will register for this course in the spring semester following the summer E I-II academic phase. Classes will meet synchronously once per week from January to May, in an online format.

Prerequisite: Admission to the E I-II master's program.

**EDU 5801 - The Beginning Special Education Teacher (1)**

A study of the historical, philosophical, ethical, and legal foundations for creating an inclusive and effective special education learning environment that ensures academic and social success for all learners. Clinical placement required. Prerequisite: Acceptance into the Special Education Mild Intervention graduate certificate program

Prerequisite: Acceptance into the Special Education Mild Intervention graduate certificate program.

**EDU 5803 - Literacy for Students with Mild Exceptional Needs I (3)**

A study of scientifically based reading instruction used to positively impact the growth of all learners. Areas of study include essential components of literacy assessment, instruction, intervention, and ongoing progress monitoring that is developmentally appropriate for diverse learners with mild exceptional needs. Clinical placement required. Prerequisite: Admitted to the Special Education Mild Interventions graduate certificate program

Prerequisite: Admitted to Special Education Mild Interventions graduate certificate program.

**EDU 5812 - Building Teams to Support Learners (2)**

A study of the roles in the case conference process and information used by the team to provide free and appropriate education for all learners. Clinical placement required.

Prerequisite: None.

**EDU 5813 - Literacy for Students with Mild Exceptional Needs II (3)**

A study of multiple approaches used in the teaching of reading including scientifically based reading programs, phonics, and literature-based programs. A study of reading methods, strategies, and techniques designed to help learners who are experiencing literacy difficulties. Clinical placement required.

Prerequisite: None.

**EDU 5822 - Using Assessments to Write IEPs and Goals (2)**

A study of the development, implementation, and interpretation of learner assessments and their uses to develop appropriate goals for diverse learners with mild exceptional needs. Clinical placement required.

Prerequisite: None.

**EDU 5832 - The Development of Learners with Mild Exceptional Needs (2)**

A study of the characteristics and needs of diverse learners with disabilities. Factors that affect the learning and development of learners with mild exceptional needs are examined. Clinical placement required.

Prerequisite: None.

**EDU 5842 - Special Education Law (2)**

A study of current special education law and the application thereof. Content includes current issues, state and federal policies, and the rights, roles, and responsibilities of all stakeholders regarding the education of learners with mild exceptional needs. Clinical placement required.

Prerequisite: None.

**EDU 5852 - Methods of Teaching Learners with Mild Exceptional Needs (2)**

A study of methodologies, techniques, technology, materials, and curricular resources used in teaching learners with mild exceptional needs. Clinical placement required.

Prerequisite: None.

**EDU 5862 - Strengthening Teams to Support Learners (2)**

A study of methods to support the roles in the case conference process and organizing the information used by the team to provide free and appropriate education for all learners. Clinical placement required.

Prerequisite: None.

**EDU 5872 - Preparing to Transition Learners (2)**

A study of strategies for teaching independent living skills and promoting life transitions in learners with mild exceptional needs. Clinical placement required.

Prerequisite: None.

**EDU 5882 - Behavioral Analysis of Learners with Mild Exceptional Needs (2)**

A study of positive behavioral interventions and supports for diverse learners with mild exceptional needs, including interventions and applications to all classroom environments. Clinical placement required.

Prerequisite: None.

**EDU 5891 - Transitioning Learners with Mild Exceptional Needs (1)**

A study of methods to support diverse learners with mild exceptional needs to acquire skills needed in successful transitions. Professional roles and responsibilities of the special education teacher are applied. Clinical placement required.

Prerequisite: None.

# EDUV-Education Graduate Certificate

**EDUV 5002 - Advanced Classroom Management: Children as Change Agents (K-12) (2)**

Virtual Education Software (VESi)

Geared primarily for professionals (e.g., regular or special educators, instructional assistants, school psychologist, counselors) serving children and youths presenting behavior problems in the school or community. This course focuses on cognitive and cognitive-behavioral interventions (often lumped together under the rubric "social skills") with an emphasis on teaching students how to change and manage their own behavior. Since previous knowledge and understanding of traditional behavioral (operant) concepts and strategies is required, it is strongly recommended that you take an introductory behavior management course to learn the basic terms and concepts of behavior management prior to taking this advanced course.

**EDUV 5003 - Behavior is Language: Strategies for Managing Disruptive Behavior (5-12) (3)**

Virtual Education Software (VESi)

Welcome to *Behavior is Language*, an interactive distance learning course, designed to give you a new perspective on student behavior and effective tools for facilitating positive student change. *Behavior is Language* provides a developmental framework for understanding what students are trying to tell you through the “language” of their behavior. The course teaches behavioral techniques and intervention strategies that remediate disruptive behaviors, reduce power struggles while increasing classroom control and reduce your workloads and burnout. This program helps you, as well as students, find creative, effective solutions to behavioral problems.

After you have completed your studies in the chapters on behavioral theory and interventions, you will be presented with various classroom scenarios in which you will be able to practice and hone your skills for interpreting behavior, determining appropriate interventions and effectively debriefing your students.

Although all of the course content presented in this course can be applied to any person of any age or ability level, some of the intervention strategies require that a certain level of intellectual and verbal skill be possessed by the students if they are to complete verbal and written debriefs. Debriefs will need to be adjusted for younger or less skilled individuals.

**EDUV 5012 - Attention Deficit/Hyperactivity Disorder: Information & Interventions for Effective Teaching (K-6) (2)**

Virtual Education Software (VESi)

Welcome to *Attention Deficit/Hyperactivity Disorder* (ADHD), an interactive distance learning course designed to help you achieve a better understanding of ADHD and provide intervention strategies to facilitate positive student change. *Attention Deficit/Hyperactivity Disorder* provides information on the history of the disorder, accepted methods to assess and identify students with the disorder, and various treatment methods that are currently being used to treat the disorder. The course helps you through the referral process when you feel a student needs services beyond what you are capable of or comfortable providing in your classroom environment. This course also lists resources for both teachers and parents who would like more help or information about ADHD.

**EDUV 5013 - Early Childhood: Observation & Assessment (EC) (3)**

Virtual Education Software (VESi)

Welcome to *Early Childhood: Observation & Assessment*, an interactive distance learning course which explores observation and assessment instruments, as well as recommended practices and available resources for infants, toddlers, and preschoolers. Content includes an emphasis on observing young children and assessing their early childhood learning environments.

**EDUV 5022 - Autism & Asperger’s Disorder: Information & Effective Intervention Strategies (K-12) (2)**

Virtual Education Software (VESi)

Welcome to *Autism & Asperger’s Disorder*, an interactive computer-based instruction course designed to help you achieve a

better understanding of Autism and Asperger's Disorder, of intervention strategies to enhance communication and learning, and of methods for teaching more conventional behaviors. *Autism & Asperger's Disorder* provides information on the characteristics of the disorder, learning styles associated with the disorder, communication weaknesses, and various intervention strategies that have proven to be successful when working with students with Autism Spectrum Disorder. The course helps you comprehend why individuals with Autism Spectrum Disorder act the way they do, and what you can do to enhance more appropriate behavior. This course also lists resources for educators, related service personnel, and parents who would like more help or information on autism and Asperger's Disorder.

**EDUV 5023 - Early Childhood: Program Planning (EC) (3)**

Virtual Education Software (VESi)

Welcome to *Early Childhood: Program Planning*, an interactive distance learning course designed to give you a new perspective on planning and implementing developmentally appropriate practices for young children from birth through age eight. In this course you will learn what is meant by curriculum, assessment, evaluation, and program planning as these terms apply to early childhood education. We will discuss several historical perspectives and theories on child development and examine best practice for early childhood education. We will also examine key concepts and specific activities for teaching various curricular content areas, including language and literacy, mathematics and science, and the expressive arts.

**EDUV 5032 - Build School Communities: Brain Smart Classroom Management (K-12) (2)**

Virtual Education Software (VESi)

This course helps teachers build genuine bonds between themselves and their students and between students and their classmates, to create "kindred classhomes" with a foundation of acceptance, respect, and shared purpose. For many of our students, our classrooms may be a safe, nurturing refuge…the eye of the hurricane they experience as life. This course will help you develop strategies, rituals, and environmental design skills to create these safe havens of learning: kindred classhomes where students and teachers work together in synergistic ways that benefit all members of the school family. Students will learn how to differentiate for classroom management and discipline similarly to differentiating for students' diverse academic needs. One size does not fit all, but all sizes can fit together.

**EDUV 5033 - Early Childhood: Typical & Atypical Development (EC) (3)**

Virtual Education Software (VESi)

Welcome to *Early Childhood: Typical & Atypical Development*, an interactive distance learning course that covers development during the first six years of life and research-based best practices in early learning. Included will be typical development from the prenatal stage to middle childhood with an emphasis is on individual differences, cultural influences, and the impact of developmental delay and disability. Discussion will also include instructional technology (IT) and assistive technology (AT) applications for this population.

**EDUV 5042 - Child Abuse: Working with Abused & Neglected Children (P-12) (2)**

Virtual Education Software (VESi)

Welcome to *Child Abuse: Working with Abused & Neglected Children,*an interactive computer-based instruction course, designed to help you identify and effectively teach students affected by child abuse and/or neglect. This course discusses the identification of physical, emotional, and sexual abuse; the impact of abuse on the behavior and learning abilities of students; the responsibilities of a teacher to report abuse or provide assistance to students who are the victims of abuse; and methods for teaching students about abuse of all types and its prevention. It also discusses the specific factors that exist in families who abuse or neglect their children. A major emphasis in this course is on helping the participant understand the special learning needs of the abused or neglected child, and how to meet those needs in the regular classroom. Working with parents and community agencies is also emphasized.

This course meets the child abuse and neglect educational requirement in most states. It is the responsibility of the student to

verify the course content with your specific state professional licensing agency to ensure proper credit.

**EDUV 5043 - English Language Learner: Language Acquisition (K-12) (3)**

Virtual Education Software (VESi)

*English Language Learner: Language Acquisition* was written to help teachers understand concepts and terms related to educating students whose first language is not English. This course discusses developmental theories and how they apply to English language learners. The focus of this course is on the process of second language acquisition and the role of the classroom teacher. Included in this course is information about literacy development, integrating language, co-teaching, ELL instructional needs and the legal obligations of schools and teachers to provide services and about the types of programs schools might provide. Also included is information on communicating with parents/guardians.

**EDUV 5052 - Drugs & Alcohol in Schools: Understanding Substance Use & Abuse (5-12) (2)**

Virtual Education Software (VESi)

Welcome to *Drugs & Alcohol in Schools*, an interactive computer-based instruction course, designed to give you a more comprehensive understanding of alcohol, drugs, and their influences in your classroom. *Drugs & Alcohol in Schools* provides a contextual framework for understanding what students may be experiencing through their own substance use or the impact of substance use around them. The course provides a basic historical perspective of substance use along with descriptions of biological, psychological, and social factors that comprise the disease of addiction. This program will help you better understand a multitude of complex dynamics that contribute to this biological and social phenomenon.

**EDUV 5053 - English Language Learner: Methods & Materials (K-12) (3)**

Virtual Education Software (VESi)

*English Language Learner: Methods & Materials* was written to help teachers understand concepts and terms related to educating students whose first language is not English. This course discusses how to apply instructional methods in creating lessons; how to create a motivating and caring learning environment; how to integrate teaching reading, writing, speaking, and listening skills; how to differentiate instruction for English language learners; and how to identify culturally appropriate curriculum and instructional resources.

**EDUV 5062 - Early Childhood: Family-Centered Services (EC) (2)**

Virtual Education Software (VESi)

Welcome to *Early Childhood: Family-Centered Services*, a course that seeks to promote the development of thoughtful, knowledgeable, effective educators for a diverse society. The course provides conceptual frameworks for working with families of children from a variety of backgrounds. Course content places an emphasis on family-centered practices designed to help early childhood professionals involve and support families in the care and education of children.

**EDUV 5063 - Learning Disabilities: Practical Information for the Classroom Teacher (K-12) (3)**

Virtual Education Software (VESi)

*Learning Disabilities: Practical Information for the Classroom Teacher*, is an interactive computer-based instruction course, that provides an introduction to the field of Learning Disabilities for special education teachers, general classroom teachers, integration teachers and related professionals, especially those working in the areas of language, psychology and counseling.

**EDUV 5072 - Educational Assessment: Assessing Student Learning in the Classroom (K-12) (2)**

Virtual Education Software (VESi)

Welcome to *Educational Assessment: Assessing Student Learning in the Classroom*! Curriculum, instruction, and assessment work together to support student learning. Students are provided with opportunities to learn the skills, concepts, and work-study

practices necessary to be successful in classrooms. Assessments measure student progress toward the standards, help teachers identify each student's instructional needs, and inform parents about what and how their child is learning. The assessments also help to gauge how well schools are supporting the achievement of all students.

However, no matter how many assessments there are, without educators able to use assessments, those assessments are worthless. As educators, we must know how to conduct the assessment, interpret the data, and develop priorities for action. We also must take into account data from other sources, notably the parents and psychologists. We then have to put all this information into some organized format and make the information clear to colleagues and parents.

In order to do this, we have to bring our skills and knowledge about the subject matter into play while answering these questions:

• What is the prerequisite knowledge for this area of the curriculum?

• How important is the particular area?

• Would having a "less than very high" level of competence in one area predispose the child to failure in other areas?

• How much time should be spent on a particular topic?

• Should we consider an alternative area?

**EDUV 5073 - Reading Fundamentals #3: The Elements of Effective Reading Instruction & Assessment (K-12) (3)**

Virtual Education Software (VESi)

This course will focus on learning to read, reading to learn, and an introduction to reading assessment. As part of these two key areas of reading instruction, the five elements of effective reading instruction will be highlighted, including definitions, implications for instruction, and future directions. These five elements include instruction in÷ phonemic awareness, phonics, fluency, vocabulary, and text comprehension. Further, we discuss information on teacher preparation in learning about comprehension strategy instruction and reading instruction, as well as how to integrate computer technology into the classroom. Additionally, the course will provide information on important assessment terms and definitions and will explore how reading assessment fits within federal mandated programs, including the Common Core State Standards in English Language Arts. This analysis includes specific recommendations for understanding student reading needs using screening, diagnostic, and progress-monitoring assessments. Finally, the course describes how teachers can conduct and use pivotal curriculum-based measurement procedures in their classrooms.

**EDUV 5082 - Harassment, Bullying & Cyber-Intimidation in Schools (K-12) (2)**

Virtual Education Software (VESi)

*Harassment, Bullying & Cyber-Intimidation in Schools* will discuss definitions and the personal, social, and legal ramifications associated with sexual harassment, bullying, and cyber-intimidation. The course will address what we know about these troubling areas. We will then explore preventative strategies as well as how school staff can address these issues when they occur. A clear understanding of what constitutes harassment and the harmful effects of harassment on people and institutions is essential to providing a safe and inclusive school environment for all.

**EDUV 5083 - Response to Intervention: Practical Information for the Classroom Teacher (K-12) (3)**

Virtual Education Software (VESi)

Welcome to *Response to Intervention: Practical Information for the Classroom Teacher,* a course providing an introduction to the Response to Intervention process for special education teachers, general classroom teachers, parents, and related professionals.

**EDUV 5092 - Inclusion: Working with Students with Special Needs in General Education Classrooms (K-12) (2)**

Virtual Education Software (VESi)

*Inclusion: Working with Students with Special Needs in General Education Classrooms* was written to help teachers understand concepts and terms related to educating students in inclusive classrooms. The course also helps teachers learn about the continuum of placements school systems can use in providing special education and related services to students with disabilities. Information discussed is also designed to help you understand the federal definition of students entitled to special education services, as well as procedures you can use in determining whether these students can be educated in the regular classroom. The course also identifies and describes the roles and responsibilities of special and general educators in providing special education services to students educated in inclusive classrooms and instructional and classroom management strategies teachers can use to work with these students in the least restrictive environment.

**EDUV 5093 - Teaching Secondary Math Conceptually: Meeting Mathematics Standards (5-12) (3)**

Virtual Education Software (VESi)

Welcome to *Teaching Secondary Math Conceptually: Meeting Mathematics Standards*, an interactive computer-based instruction course designed to expand your methodology for teaching Mathematics. The course will explore an instructional methodology that incorporates strategies for teaching concepts, constructively, and contextually. The goal is for you to gain a deeper understanding of the underlying concepts of various math topics and explore the principles of teaching those concepts to learners. The course will also explore teaching methodologies that support many federal and state standards. This course will focus on the topics of integers, fractions, factoring, and functions.

**EDUV 5102 - Infant & Toddler Mental Health: Issues & Information for Educators (EC) (2)**

Virtual Education Software (VESi)

Welcome to *Infant & Toddler Mental Health: Issues & Information for Educators*, an interactive computer-based instruction course designed to help you achieve a better understanding of infant and toddler mental health, child development, and strategies you can use to promote positive relationships with children and their families. This course provides information that will help you to understand and identify your role as a child care provider, educator, and early childhood professional. *Infant & Toddler Mental Health* will provide you with research-based information on child development, attachment, temperament, and curriculum. This course also lists resources for both teachers and parents who would like more help or information about infant and toddler mental health.

**EDUV 5103 - Try DI!: Planning & Preparing a Differentiated Instruction Program (K-12) (3)**

Virtual Education Software (VESi)

Welcome to *Try DI!: Planning & Preparing a Differentiated Instruction Program*, an interactive computer-based instruction course. This course is designed to provide you an opportunity to learn about an instructional framework, Differentiated Instruction (DI), aimed at creating supportive learning environments for diverse learning populations. Students will be presented a method for self-assessment of the extent to which their current instructional approach reflects the perspective, principles, and practices of the DI approach. The course reflects an approach that aligns the principles of DI with the practices of DI. The concept of a "theory of action" will also be provided within a DI context. The course has also been designed to introduce students to a range of strategies associated with a DI approach. Strategies included in this course have been selected on the basis that they are effective in the widest possible range of educational K-12 settings. This course follows *Why DI?: An Introduction to Differentiated Instruction*, which addressed the **What, Why,** and **Who** of a classroom that reflects a DI approach. The focus of *Try DI!: Planning & Preparing a Differentiated Instruction Program* is on the **When, Where,** and **How** of the DI approach.

*Try DI!: Planning & Preparing a Differentiated Instruction Program* is an invitation to reflect, explore, and anchor professional practices in the current literature and growing research base in support of DI. This course is designed for anyone working with a diverse learning population across the K-12 spectrum and will have the most direct application to professionals serving students within a mixed-ability classroom setting.

**EDUV 5112 - Understanding & Implementing Common Core Standards (K-12) (2)**

Virtual Education Software (VESi)

Welcome to *Understanding & Implementing Common Core Standards,* an interactive computer-based instruction course designed to give you a deeper understanding of the rationale for and structure of this particular standards-based framework. In this course you will learn a number of factors that contributed to the overall design of the Common Core Standards as well as practical pedagogical approaches that will support practitioners working toward deeper implementation. We will reflect on the instructional "shifts" emphasized throughout the Common Core Standards and contextualize the shifts based on the diverse population of students course participants serve. *Understanding & Implementing Common Core Standards* will also provide connections to a variety of instructional considerations that will support implementation regardless of educational context. Practitioners will be provided opportunities to reflect on current practice and the degree to which they align with the Common Core Standards as well as with colleagues across a wide range of settings implementing these standards.

**EDUV 5202 - Reading & Writing in Content Area (5-12) (2)**

Virtual Education Software (VESi)

This course offers instruction in teaching reading and writing in various subject matter fields at the secondary level. The material stresses the skills of vocabulary building, comprehension, and writing, as well as methods for motivating adolescents to read and write.

**EDUV 5203 - Understanding Aggression: Coping with Aggressive Behavior in the Classroom (P-12) (3)**

Virtual Education Software (VESi)

This course is about violence in America, about the aggression in our schools, classrooms, streets, homes and elsewhere. The course speaks to the hate, the fights, the anger, the crimes committed and the victims in our schools and society. It is a course about students, children, teenagers, adults and neighbors, all of us.

The course will consider the many forms of aggression, both criminal and otherwise; its costs and motivation; its perpetrators and targets; its likely and unlikely locations; its impact on our schools, the children; and, most especially, its several causes and promising solutions.

Topics of interest will include violence and the challenge of raising and working with children; aggression in our classrooms; American youth gangs and their influence; past and future sports violence; "hot spot" locations of frequent violence; and the aggression-promoting role of alcohol, temperature, driving, television and other features of modern life. The course also will answer questions such as: Is aggression always bad? How do aggressive thoughts lead to aggressive actions? Is aggression, at least for some people, an addiction? Does the victim contribute to being attacked? Is dating a dangerous proposition? How are the acts of aggression dealt with in other countries, and are there any lessons for America?

The goal of this course is to help educators and adults in general better understand how aggression affects our lives and the lives of children. Hopefully such greater understanding and more skilled efforts at prevention will substantially reduce the aggression and violence that has become all too common in America's schools.

**EDUV 5302 - Reading Fundamentals #1: An Introduction to Scientifically-based Research (K-6) (2)**

Virtual Education Software (VESi)

Reading Fundamentals supports the concept of scientifically-based reading research to develop a phonetically-based approach to reading assessment, instruction, evaluation, and remediation.

*An Introduction to Scientifically-based Research*, the first in the three-course Reading Fundamentals series on effective reading instruction, was designed to give background on scientifically-based instruction as it applies to the federal legislation of 2001. The course discusses the research that supports scientifically-based research as it applies to phonetically-based instruction, assessment, and evaluation. The course explores myths and misconceptions concerning reading instruction and remediation. It

also presents an evaluation checklist designed to assess the effectiveness of your current reading program. The goal of the course is to present you with research, trustworthy evidence, and background information that support the need for a reading program that is based on scientific research and proven methods.

**EDUV 5303 - Violence in Schools: Identification, Prevention & Intervention Strategies (P-12) (3)**

Virtual Education Software (VESi)

Welcome to *Violence in Schools*, an interactive computer-based instruction course, designed to give you a better understanding of school violence and increase your interventions strategies. *Violence in Schools* provides a foundational understanding of violence and the motivational purposes behind aggression. The correlation with and impact of the media, community and family upon violence will be investigated. The course teaches identification and intervention approaches for working with out-of-control behaviors. In addition, each student will receive information on available national resources for both parents and teachers. This course will help each person to increase his or her understanding of violence, the motivations behind the use of violence and specific strategies to minimize the occurrence of violence in a school and community.

**EDUV 5402 - Reading Fundamentals #2: Laying the Foundation for Effective Reading Instruction (K-6) (2)**

Virtual Education Software (VESi)

The federal legislation enacted in 2001 mandates the use of scientifically-based research in programs receiving federal funding that deal with remedial readers. The concept of scientifically-validated methods is so prevalent in the legislation that it appears 110 times in these documents. This three-course Reading Fundamentals series will help improve your knowledge of science and the scientific process suggested for development of remedial reading programs. This knowledge will make you a more informed consumer and an even better advocate for students.

The purpose of this second course in this three-course series is to lay the foundation for effective reading instruction. As part of this course, you will learn about the elements of effective instruction. It is important that all teachers have a firm understanding of effective instructional procedures. Teachers benefit, and more importantly, students benefit, both in terms of their behavior and their academic performance, from effective instruction. Further, you will learn about the importance of reading instruction and read some sobering statistics on reading performance in this country and what happens when individuals are not proficient in reading.

**EDUV 5403 - Why DI?: An Introduction to Differentiated Instruction (K-8) (3)**

Virtual Education Software (VESi)

Welcome to *Why DI?: An Introduction to Differentiated Instruction*, an interactive computer-based instruction course, designed to give you an understanding of the framework of and need for creating supportive learning environments for diverse learning populations. In this course you will learn what is meant by Differentiated Instruction (DI) and the common myths associated with creating the differentiated classroom. We will discuss the legal, theoretical, and pedagogical foundations in the field of education that support the utilization of differentiated instructional practices and principles. We will reflect on best practices and national trends in the design of the educational setting to meet the needs of a diverse learning population. *Why DI?: An Introduction to Differentiated Instruction* will also provide connections to a variety of concepts, variables, and resources that will assist practitioners in aligning their own professional practices with those found in the differentiated classroom.

**EDUV 5502 - Six Traits of Writing Model: Teaching & Assessing (P-12) (2)**

Virtual Education Software (VESi)

Welcome to *Six Traits of Writing Model: Teaching & Assessing*, a course geared primarily for professionals (e.g., regular or special educators, instructional assistants, school psychologists, counselors) working with children and youth in any academic area. This course focuses on why teaching writing is an essential skill for life, and gives theory and practical steps to implement the six traits of writing in any classroom.

**EDUV 5503 - English Language Learner: Evaluation & Assessment (K-12) (3)**

Virtual Education Software (VESi)

This course was written to help teachers understand concepts and terms related to evaluating and assessing students whose first language is not English. This course discusses high-quality assessment and the scope of assessments, including initial placement, annual assessments, and exit assessments. This course ends with a discussion of classroom assessments, including accommodations for those who need language assistance.

**EDUV 5602 - Talented & Gifted: Working with High Achievers (K-6) (2)**

Virtual Education Software (VESi)

Welcome to Talented & Gifted, an interactive computer-based instruction course designed to help you achieve a better understanding of the talented and gifted student, methods used in identification, and strategies for instruction of these students in an inclusive classroom. Talented & Gifted provides information on the history of the exceptional in relation to education, current law, and accepted methods for referral, assessment, and identification of these students. The course also covers methods of differentiating instruction to meet the rate and level of learning of those students identified. The course gives you an understanding of ways to meet the affective needs of the gifted and talented student in the regular classroom.

**EDUV 5603 - English Language Learner: Linguistics (K-12) (3)**

Virtual Education Software (VESi)

The course was written to help teachers understand concepts and terms related to educating student whose first language is not English. This course discusses how to understand theoretical foundations of linguistics and how to apply the knowledge and skills in linguistics in ELL classrooms and content classroom.

**EDUV 5702 - Teaching Diversity: Influences & Issues in the Classroom (K-12) (2)**

Virtual Education Software (VESi)

Welcome to *Teaching Diversity: Influences & Issues in the Classroom*, an interactive computer-based instruction course, designed to give you the knowledge and tools to facilitate a diverse classroom effectively. This course will help you understand and identify differences in approaches to learning and performance, including different learning styles and ways in which students demonstrate learning. This course will emphasize understanding how students' learning is influenced by individual experiences, talents, disabilities, gender, language, culture, family, and community values. You will be challenged to apply knowledge of the richness of contributions from our diverse society to your teaching field.

**EDUV 5802 - Teaching Elementary Math Conceptually: A New Paradigm (K-6) (2)**

Virtual Education Software (VESi)

Welcome to *Teaching Elementary Math Conceptually*, an interactive computer-based instruction course designed to expand your methodology for teaching Mathematics. The course will explore an innovative teaching model that incorporates strategies for teaching concepts constructively and contextually. The goal is for you to gain a deeper understanding of the underlying concepts of various math topics and to explore the principles of teaching those concepts to learners. This course will focus on the topics of number sense, basic operations, and fractions.

**EDUV 5902 - Traumatized Child: The Effects of Stress, Trauma & Violence on Student Learning (P-12) (2)**

Virtual Education Software (VESi)

Welcome to *Traumatized Child: The Effects of Stress, Trauma & Violence on Student Learning,* an interactive computer-based instruction course designed to help you identify and effectively teach students affected by stress, trauma, and/or violence. This course teaches you to recognize the signs of stress, trauma or violence in students. It also discusses the specific factors that exist in families and communities where stress and violence are common. A major emphasis in this course is on helping the participant understand the special learning needs of the student who is experiencing stress, trauma or violence in his/her life and how to meet his/her needs in the regular classroom. Working with parents and community agencies is also emphasized.

# EGR-Engineering Graphics

**EGR 141 - Introduction Spatial Visualization (1)**

Through instruction and exercises spatial visualization skills will be developed in preparation for engineering coursework and/or advanced coursework. Students will learn how to visualize objects in 3D and communicate that same object on 2D medium by developing their spatial thinking.

**EGR 143 - Engineering Graphics (3)**

Graphical communication for engineers using sketching and computer-aided drafting. The fundamentals of orthographic projection, isometric projection and descriptive geometry are taught. An introduction to three dimensional models using solid modeling computer software is also covered. Emphasis is placed on developing the skills needed for mechanical engineering design.

**EGR 152 - Engineering Graphics for Civil Engineering (2)**

Graphical communication by means of sketching and computer-aided drafting. Fundamentals of orthographic projection and descriptive geometry. This course stresses applications of graphic communications, both manually and through the use of CAD systems.

**EGR 453 - Advanced Parametric Design (3)**

An introduction to Unigraphics NX design software which includes modeling basics as well and an in depth look at the advanced capabilities of the software as it applies to engineering design. Prerequisite: EGR 143 or ETD 263

Prerequisite: EGR 143 or ETD 263.

# EM-Emergency Management

**EM 253 - Disaster Relief & Recovery (3)**

The purpose of this course is to address relief and recovery from disasters that occur. The majority of effort will focus on natural disasters, but planned (e.g., terrorism) and unplanned (e.g., oil tanker spills) will be covered as well. Policies, programs and procedures for managing the relief effort and methods of providing the best return to normalcy will be discussed and assessed. Also covered will be the concept of minimizing the occurrences and damages of recurring future events.

**EM 343 - Incident Management (3)**

This course examines the National Incident Management System (NIMS). It explores the five major components of NIMS, preparedness, communications and information management, resource management, command and management and finally ongoing management and maintenance. In particular the course will address command and management and the Incident Command System (ICS). This course will explore both scene management and the interface with multi-agency coordinating groups. The course also addresses management of the multi-agency coordinating groups. The course will explore the difference between disaster management and daily incident management.

**EM 383 - Preparedness & Response Operations (3)**

The purpose of this course is to promote effective disaster response and management. The course will examine the nature of disasters and the roles of various agencies and actors in response to them. The course will also explore various preparedness strategies that enable more effective disaster response. Past responses will be examined as well as problem solving to propose solutions and improvements that could positively impact future responses. Each student will be expected to gain a solid comprehension of common post-disaster problems as well as effective means of overcoming those challenges and problems.

**EM 423 - Social Dimensions Of Disaster (3)**

This course will be an overview of empirical versus theoretical approaches; human behavior in disaster; myths and reality; group disaster behavior; community social systems and disaster; cultures, demographics, and disaster behavior distinctions; and

model-building in sociological disaster research.

# ENG-English

**ENG 133 - Technical Communication (3)**

Professional communication within STEM fields emphasizing readers' needs to interact with technical information using communication designed for that purpose through language, organization, design, and graphics. After gathering appropriate information using a variety of research methods, communicators will collaborate to present that information in a way that meets readers' needs.

**ENG 143 - College Composition (3)**

Intensive training in methods of exposition and research leading to the ability to write coherent, clear, and persuasive essays. This course focuses on the process of writing, which includes revision and editing of the equivalent of at least 20 pages of prose (approximately 5,000 words).

**ENG 153 - Introduction to Literature (3)**

Introduces the student to literature of some complexity and sophistication, developing a critical vocabulary and skills in reading on an advanced level. Analysis of at least three genres and taking into consideration the cultural and historical contexts of these works.

**ENG 1003 - Critical Reading & Writing (3)**

Emphasizes student reading skills necessary to successfully participate in course discussion, do research, and understand assignment instructions and requirements. Students will also respond in writing to assigned readings. Prerequisite: Completion of ESL program or permission from the Department Chair.

Prerequisite: Completion of ESL program or permission from the Department Chair.

**ENG 233 - Mythology (3)**

An introduction to world mythology, including both Western and non-Western myths. Prerequisite: ENG 143 or ENG 133

Prerequisite: ENG 143 or ENG 133.

**ENG 253 - World Literature (3)**

Introduces the student to Western and non-Western texts in translation which have influenced thought and culture. Through analysis and discussion, students will also develop an essential vocabulary and skills in critical reading. Selections will be drawn from a variety of historical eras, such as the ancient, medieval, and modern and will demonstrate diverse (i.e. gender, culture, and ethnicity), global perspectives.

**ENG 263 - Contemporary Themes in Literature (3)**

A critical study of literary works, genres or authors selected for their relevancy to current social, political, cultural, or ethical issues. Special emphasis is placed on texts addressing concerns related to marginalized communities. Prerequisites: ENG 143 or ENG 133 or ENG 153

Prerequisite: ENG 143 or ENG 133 or ENG 153.

**ENG 273 - Creative Writing (3)**

Students will experiment with a variety of creative writing genres in a workshop setting. They will maintain and develop weekly writing practices (i.e. journal, blogging, forum posting, etc.). Students will engage with the style, form, process, and product of creative writing through the genres of poetry, fiction, and prose. Prerequisite: ENG 143 or ENG 133

Prerequisite: ENG 143 or ENG 133.

**ENG 2013 - British Literature I (3)**

A survey of British literature from its beginnings to 1760. Prerequisite: ENG 143 or ENG 133

Prerequisite: ENG 143 or ENG 133.

**ENG 2023 - British Literature II (3)**

A survey of British literature from 1760 to present. A broad range of texts will be covered in light of their historical, socio-political, and cultural contexts. Prerequisite: ENG 143

Prerequisite: ENG 143.

**ENG 2113 - American Literature I (3)**

A survey of American literature from its beginnings to 1890. Prerequisite: ENG 143

Prerequisite: ENG 143.

**ENG 2123 - American Literature II (3)**

A survey of American literature from1890 to present. Prerequisite: ENG 143

Prerequisite: ENG 143.

**ENG 2513 - World Literature I (3)**

Introduces the student to Western and non-Western texts in translation which have influenced thought and culture. Through analysis and discussion, students will develop an essential vocabulary and skills in critical reading. Selections will be drawn from literature up to around 1600 and will demonstrate diverse (i.e. gender, culture, and ethnicity), global perspectives. Prerequisites: ENG 143 or ENG 133

Prerequisite: ENG 143 English Composition or ENG 133 Technical Communication.

**ENG 2523 - World Literature II (3)**

Introduces the student to Western and non-Western texts in translation which have influenced thought and culture. Through analysis and discussion, students will develop an essential vocabulary and skills in critical reading. Selections will be drawn from around 1600 to the present and will demonstrate diverse (i.e. gender, culture, and ethnicity), global perspectives. Prerequisites: ENG 143 or ENG 133

Prerequisite: ENG 143 English Composition or ENG 133 Technical Communication.

**ENG 303 - Advanced Technical Communication (3)**

Examines how technical writers execute their job with an emphasis on how those techniques are applied to completed projects. Prerequisite: ENG 133

Prerequisite: ENG 133.

**ENG 333 - Studies In Literature (3)**

Detailed exploration of one of the major areas within the discipline of English. The course changes each time it is offered, with the specific topic announced in the class schedule. Prerequisite: ENG 143 or ENG 133 or ENG 153

Prerequisite: ENG 143 or ENG 133 or ENG 153.

**ENG 363 - The English Language (3)**

A study of the development of English from its origins to present day, including its place on the Indo-European language tree. The course will cover the development and change in English grammar, alphabet, spelling, syntax, and vocabulary as well as

etymology and contemporary English dialects. Prerequisite: ENG 143 or ENG 133

Prerequisite: ENG 143 or ENG 133. Corequisite: None. Crosslisted as: N/A.

**ENG 373 - Literary Theory (3)**

Introduces major literary theories such as psychoanalytic theory, structuralism, deconstruction, feminism, New Historicism, post-colonialism. Prerequisite: ENG 143

Prerequisite: ENG 143.

**ENG 3303 - The Bible as Literature (3)**

A survey of selections from the Bible with an emphasis on its component genres, literary qualities, and cultural influence. Prerequisite: ENG 143

Prerequisite: ENG 143.

**ENG 411 - Writing Center Consulting Laboratory (1)**

Practical experience tutoring writing with the Writing Center. Can be taken up to three times for credit. Corequisite: ENG 412

Corequisite: ENG 412.

**ENG 412 - Writing Center Consulting (2)**

A broad overview of composition and writing center theory, with a particular emphasis on its application in tutoring writing in small groups or conferences. Prerequisite: ENG 143 or ENG 133

Prerequisite: ENG 143 or ENG 133.

**ENG 423 - Drama (3)**

Studies of selected playwrights, movements, trends, and developments in world drama from the beginnings to the present day. Prerequisite: ENG 143

Prerequisite: ENG 143.

**ENG 433 - Shakespeare & His Times (3)**

Students will read at least eight of Shakespeare's plays from a variety of genres. Discussion will include a variety of theoretical lenses, Shakespeare scholarship, the sonnets, and the differences between written texts and performance.

**ENG 443 - Poetry (3)**

An investigation of the poetic process through the careful examination of selected poems and statements about poetry. Prerequisite: ENG 143

Prerequisite: ENG 143.

**ENG 453 - Advanced Composition (3)**

This course prepares students for exposition and oral communication both in and outside the classroom setting through an in-depth study of the functions and conventions of various types of professional genres and research across different disciplines (such as English and Health Sciences). Students will investigate the role composition and research play in their chosen career paths through the execution of a primary research design project and presentation. Prerequisite: ENG 143 or ENG 133

Prerequisite: ENG 143 or ENG 133. Corequisite: none. Crosslisted as: none.

**ENG 4001 - Directed Studies in English (1)**

For senior students of superior ability able to assume a larger share of the responsibility for designing and pursuing a reading

research project which is academically respectable. Prerequisite: Permission of the Department Chair

Prerequisite: Permission of the Department Chair.

**ENG 4002 - Directed Studies in English (2)**

For senior students of superior ability able to assume a larger share of the responsibility for designing and pursuing a reading research project which is academically respectable. Prerequisite: Permission of the Department Chair

Prerequisite: Permission of the Department Chair.

**ENG 4003 - Directed Studies in English (3)**

For senior students of superior ability able to assume a larger share of the responsibility for designing and pursuing a reading research project which is academically respectable. Prerequisite: Permission of the Department Chair

Prerequisite: Permission of the Department Chair.

**ENG 4013 - Capstone Study in English (3)**

A capstone course for students who plan to enter law or graduate school and who are capable of writing a polished, academically significant research paper in the field of English. Prerequisite: Permission of the Department Chair

Prerequisite: Permission of the Department Chair.

**ENG 4023 - Senior Capstone Internship (3)**

Students work at least 100 hours in an internship gaining discipline-related work experience leading to a formal presentation and an analytical research report of approximately 20 pages.

Prerequisite: Permission of the Department Chair.

**ENG 501 - Research & Writing Skills for Professional Success (1)**

This course provides students with the knowledge and practice to improve their skills at reading, writing, and research-fundamental skills necessary for success in graduate school and beyond.

# ENT-Entrepreneurship

**ENT 303 - Entrepreneurial Leadership (3)**

This course examines leadership, influence, and power as it relates to entrepreneurship with a strong emphasis on entrepreneurial character traits and business ethics. Historical, literary, and contemporary examples of successful entrepreneurs provide a framework for examining the theories of leadership and power. Corequisite: MGT 363

Corequisite: MGT 363.

**ENT 323 - Engineering Concepts (for non-engineering majors) (3)**

Fundamental engineering concepts are introduced, with an emphasis on developing foundations for lifelong learning of technological issues. Broad-based technologies and the importance of technical communication are emphasized. Current and future technologies are discussed by visiting practitioners. Not open to students enrolled in the engineering and technology programs. Prerequisite: MGT 353

Prerequisite: MGT 353.

**ENT 413 - Creativity-Product/Service Development (3)**

This course explores the nature of creativity from four interacting viewpoints: person, process, product, and environment. Its goal is to develop students' awareness of their creative potential. Activities include group work, discussion, and the

development of an idea or invention. Prerequisite: BA 123

Prerequisite: BA 123.

**ENT 423 - Entrepreneurship & Venture Planning (3)**

This course focuses on entrepreneurship and small business management. Through case studies, simulations, guest lectures, reading and business plan development, students become aware of the unique challenges facing small business owners and entrepreneurs. Students become familiar with the resources available to small business owners by developing and presenting a business start-up plan. Prerequisite: BA 123, MA 253

Prerequisite: BA 123, MA 253.

# ES-Engineering Science

**ES 141 - Biology for Engineers (1)**

This course serves as an industry biology course specific to engineering applications. The following basic topics are discussed at an introductory level: the chemical make-up of living systems, structure and function at the sub-cellular and cellular levels, cell metabolism, and genetics. Students that come in with BIO 114 equivalent transfer credit would be exempt from this course. Prerequisite: Open to engineering and technology majors only

Prerequisite: Open to engineering and technology majors only.

**ES 213 - Statics (3)**

The first course in engineering mechanics. Subjects cover includes; force and moment vectors, equivalent systems, trusses, frames, and machines, equilibrium of particles and rigid bodies, static friction, centroids and moments of inertia. Corequisite: MA 164, PH 224

Corequisite: MA 164, PH 224.

**ES 223 - Dynamics (3)**

Kinematics of absolute and relative motion of particles and rigid bodies. Subjects include; kinetics of particles and particle systems. Principles of work and energy, impulse and momentum, and impact. Kinetics of rigid bodies in plane motion. Prerequisite: MA 164 and PH 224, and Grade of C or better in ES 213

Prerequisite: MA 164 and PH 224, and Grade of C or better in ES 213 .

**ES 233 - Engineering Materials (3)**

A study of the structure and properties of materials. Materials covered include metals, ceramics, polymers, and composites. Mechanical properties are emphasized, electrical properties, thermal properties, and environmental interactions are addressed. Structural features at the atomistic level, the crystal structure level, and the microstructure level of single and polyphase materials are studied in terms of their effects on material properties. Prerequisite: CH 103 or CH 104 or CH 155H; Corequisite: PH 224

Prerequisite: CH 103 or CH 104 or CH 155H; Corequisite: PH 224. Corequisite: PH 224.

**ES 243 - Solid Mechanics (3)**

Concepts of stress and strain in engineering materials. Subjects include; Hooke's law and Poisson's relationship, analysis of axial, shear, flexural, and torsional stresses, combined stress, shear and moment distribution in beams, and deformation of structural members. Prerequisite: Grade of C or better in ES 213

Prerequisite: Grade of C or better in ES 213.

**ES 253 - Electrical Science (3)**

Linear circuit analysis is studied by placing emphasis on the modified nodal admittance matrix method and circuit transformations. Students will: formulate a solution for any circuit containing terminally-defined resistors, capacitors, inductors, coupled inductors, ideal transformers, dependent and independent sources; use professional software to simulate circuits and to facilitate computations and mathematical operations. Prerequisites: MA 164

Prerequisite: MA 164.

**ES 313 - Thermodynamics (3)**

Introduction to properties of substances and ideal gases by use of tables. Introduction to thermodynamic concepts of systems, control volumes, heat, work and internal energy. Formulation of the First and Second Laws of Thermodynamics with engineering applications, Vapor Water Systems Ranking cycle, First and Second Law analysis of power plant cycles. Prerequisites: PH 224 and ES 213, and Grade of "C" or better in MA 164

Prerequisite: PH 224 and ES 213, and Grade of "C" or better in MA 164.

**ES 323 - Fluid Mechanics (3)**

Fundamental properties of fluids. Fluid statics. Kinematics of fluid motion. Conservation of mass, energy and momentum as applied to compressible and incompressible fluids. Similitude. Introduction to laminar and turbulent boundary layers. Prerequisite: ES 213; Corequisite: MA 213

Prerequisite: ES 213; Corequisite: MA 213. Corequisite: MA 213.

**ES 343 - Heat Transfer (3)**

Introduction to heat transfer analysis. Study of the primary modes of heat transfer: conduction, convection, and radiation. Engineering applications include heat exchangers, cooling of electronic components, engines, insulation. Prerequisites: ES 313, MA 233, and ES 323 or MAE 3033 or Consent of Chair

Prerequisite:  ES 313, MA 233, and ES 323 or MAE 3033 or Consent of Chair.

**ES 382 - Engineering Economics (2)**

An introduction to the economics component of design and problem solving. Application of economic concepts from present and future value of money, depreciation, and taxes to problems involving replacement studies and selection between alternative uses of capital. Methods include equivalent worth, rate of return, and incremental techniques. Prerequisite: Junior standing or permission of instructor

Prerequisite: Junior standing or permission of instructor.

**ES 4703 - Operations Management & Quantitative Decision Analysis (3)**

Understand quantitative tools available to plan and manage a project, service or production orientated operation. The class will provide insight into the quantitative decision making and optimization techniques including linear programming, queuing theory and various simulation methodologies. The discussion topics will also include project management, forecasting, inventory management, aggregate planning, materials resource planning, short term scheduling, lean production systems, maintenance and reliability.  Prerequisites: MA 253 or MA 393 (Students cannot receive credit for this course and MGT 443)

Prerequisite: MA 253 or MA 393 (Students cannot receive credit for this course and MGT 443).

# ETD-Design Engineering Technology

**ETD 101 - Introduction to Engineering Technology (1)**

This course is required for all freshman engineering technology students. Its purpose is to improve student success, to make the college experience more relevant to career goals, and to help students obtain as much assistance from the university as possible

while working toward their degree. The course will cover community building, academic goals, effective learning methods, University orientation, and personal and professional development.

Prerequisite: none. Corequisite: none.

**ETD 103 - Basic Technical Drawing (3)**

A course in the fundamentals of drafting. Use of instruments and materials, lettering and techniques of penciling. Primary emphasis is on shape and size description of three-dimensional objects. Preparation of drawings for various reproduction processes. Application of drawing geometry and study of sections and conventional practices.

**ETD 113 - Geometric Dimensioning & Tolerancing (3)**

Introduction to geometric dimensioning and tolerancing including advanced applications of dimensioning principles, tolerances and precision dimensioning. Introduction to part measurement techniques as it relates to geometric dimensioning and tolerancing. Prerequisite: ETD 103

Prerequisite: ETD 103.

**ETD 123 - Manufacturing Materials & Processes (3)**

An introduction of the physical and mechanical properties of polymers, ceramics, composites, and metal alloys. These four materials classes are quantitatively discussed in relation to modern industrial use. Processes include molding, casting, heat treating and testing of metals, machining, welding and forming in relation to product design and function.

**ETD 143 - Descriptive Geometry (3)**

Introduction to the principles of multi-view drawings and the solutions of space problems. Methods for solutions of point, like and plane problems, and the angle between planes, parallelism and perpendicularity, revolution, intersection and development problems. Prerequisites: ETD 103

Prerequisite: ETD 103.

**ETD 163 - Environmental Health & Safety (3)**

This introductory level course investigates safety philosophy and the principles of safety. The student will study occupational safety and industrial hazard control with a focus on the basic principles of accident prevention. The analysis of safety performance, cost and identification of accident potential is also studies. Emphasis is placed on concepts and techniques proven useful in reducing accidents and injuries.

**ETD 173 - Computer Aided 3-D Modeling (3)**

An Introductory course which studies the concept of parametric modeling and its application in industry. In this course students will learn the fundamentals of 3D parametric modeling utilizing SolidWorks software which includes the study of detail drawing creation, and assembly modeling. Prerequisite: "C" or better in ETD 103 or EGR 143

Prerequisite: "C" or better in ETD 103 or EGR 143.

**ETD 203 - Basic Mechanisms (3)**

An introduction to kinematics and simple mechanisms. This course studies vector algebra, linkages, mechanism design, velocity and acceleration of mechanisms, and cams and gears. The use of graphical and analytical methods is employed. Prerequisites: MA 123, PH 154

Prerequisite: MA 123, PH 154.

**ETD 233 - Engineering & Manufacturing Systems (3)**

A study of engineering and manufacturing systems such as engineering documentation systems, design control and lean manufacturing technologies. Prerequisites: "C" or better in ETD 173

Prerequisite: "C" or better in ETD 173.

**ETD 253 - Dimensional Metrology (3)**

Emphasis on methods and principles of measuring basic physical qualities for inspection and quality control. Laboratory work in measuring physical variables such as size, flatness, circularity, and total run-out. An introduction and project work in related areas, such as reverse engineering, functional gauge design, and statistical process control. Prerequisites: ETD 113, ETD 123, ETD 173

Prerequisite: ETD 113, ETD 123, ETD 173.

**ETD 263 - Design, Analysis & Prototyping (3)**

The use of the solid models and simulation as an engineering tool for problem solving. The process necessary and creation of rapid prototypes using various systems. A study of advanced techniques using computer simulation to generate results with finite element analysis. Prerequisite: ETD 233

Prerequisite: ETD 233.

**ETD 273 - Electrical Fundamentals (3)**

Electrical circuit principles. Basic circuit laws, motors, generators, controls, distribution systems, and electrical codes are presented. Theory of electricity and magnetism, electrical phenomena, and measurements. Circuits, power, AC phenomena, capacitance, and conduction are studied. Prerequisite: PH 154

Prerequisite: PH 154.

**ETD 293 - Introduction to Computer Numerical Control Principles (3)**

History of numerical control and comparison with conventional machining systems. Standard coding systems and control terminology. Prerequisites: ETD 123, ETD 173

Prerequisite: ETD 123, ETD 173.

**ETD 313 - Design for Manufacture & Assembly (3)**

Principles and methodologies for designing parts and products for: ease and efficiency of manufacture and assembly; maintenance and usability during the service life, along with disposal and recycling at the end of service life. Students will be able to apply DFMA principles to lower the cost of designing, commissioning, and using new products. Prerequisite: ETD 123, ETD 233

Prerequisite: ETD 123, ETD 233.

**ETD 323 - Product Design & Development (3)**

Introduction to product analysis, development and design. Conceptual design, design for manufacture, reverse engineering, concurrent engineering, designing for special needs, prototyping, and product safety. Integration of previous work into complete product design project. Prerequisite: ETD 233

Prerequisite: ETD 233.

**ETD 333 - Statics & Strength of Materials (3)**

Principles of statics, including the analysis of structures using both analytic and graphical methods and friction along inclined surfaces. A more in depth study of the physical properties of engineering materials through analysis of simple direct and combined stresses, determination of structural sizes as function of unit stress, and beam bending and deflection. Prerequisites: MA 134 or Permission of the Instructor

Prerequisite: MA 134 or Permission of the Instructor.

**ETD 353 - Thermodynamics & Heat Transfer for Technology (3)**

This course is an introduction to the basic properties of substances and ideal gases through the use of tables and an overview of thermodynamic concepts of systems, control volumes, heat, work and internal energy. The introductory study of heat transfer analysis and the primary modes of heat transfer: conduction, convection, and radiation will also be covered. Prerequisite: PH 164 or equivalent engineering physics course.

Prerequisite: PH 164 or equivalent engineering physics course.

**ETD 363 - Elements Of Machines (3)**

The study of design principles and calculations of machine elements. To consideration of loads, stresses, and deformations as they relate to design is presented. Failure theories, mechanical material properties, and fatigue are also studied. Prerequisite: ETD 243 or ETD 333, PH 154

Prerequisite: ETD 243 or ETD 333, PH 154.

**ETD 401 - Special Problems in Engineering Technology (1)**

Independent or internship credit for the study of special topics of particular interest in design engineering technology. Course may be taken more than once with a maximum of three credit hours. Prerequisites: Permission of the Department Chair.

Prerequisite: Permission of the Department Chair.

**ETD 402 - Special Problems in Engineering Technology (2)**

Independent or internship credit for the study of special topics of particular interest in design engineering technology. Course may be taken more than once with a maximum of three credit hours. Prerequisites: Permission of the Department Chair.

Prerequisite: Permission of the Department Chair.

**ETD 403 - Special Problems in Engineering Technology (3)**

Independent or internship credit for the study of special topics of particular interest in design engineering technology. Course may be taken more than once with a maximum of three credit hours. Prerequisites: Permission of the Department Chair.

Prerequisite: Permission of the Department Chair.

**ETD 423 - Senior Design Project (3)**

Study of advanced design methods a used in engineering design. A study of the design process as practiced the industrial setting. The procedures used from the start of a design until its final production including presentations and design reports. Prerequisites: ETD 263, ETD 323

Prerequisite: ETD 263, ETD 323.

**ETD 433 - Computer Numerical Control Principles (3)**

An advanced course that teaches students machining concepts along with CAD/CAM software knowledge in order to generate parts using computer numerical control (CNC) machines. The relationship and application of CNC to product design in engineering will also be explored.

**ETD 463 - Senior Design Project I (3)**

Introduction to product analysis, development and design. Conceptual design, design for manufacture, reverse engineering, concurrent engineering, designing for special needs, prototyping, and product safety. Integration of previous work into complete product design project. Prerequisite: Senior Standing

Prerequisite: Senior Standing.

**ETD 473 - Senior Design Project II (3)**

Study of advanced design methods as used in engineering design. A study of the design process as practiced in the industrial setting. The procedures used from the start of a design until its final production including presentations and design reports. Prerequisites: ETD 463

Prerequisite: ETD 463.

# EXS-Exercise Science

**EXS 102 - Lifetime Wellness (2)**

Positive wellness based on the value of physical activity and healthy choices is explored. The lab consists of clinical experience with personal wellness status. Personalized exercise prescriptions will be provided.

**EXS 103 - Teaching Sport Skills I (3)**

The purpose of this class is to give the student an understanding of the skills, rules, and strategies for a wide range of sports. The use of proper teaching progressions and techniques will be covered and the students will be asked to write lesson plans and demonstrate their ability to teach. (Sport Management and Exercise Science majors/minors only.)

Prerequisite: Sport Management and Exercise Science majors/minors only.

**EXS 111 - Freshman Practicum for Exercise Science (1)**

A study in Health Science career options. Includes examination of responsibilities of physical therapist, physician assistant, sports performance coach or athletic trainer. Field Experience, Journal.

**EXS 113 - Intro to Exercise Science (3)**

This class will cover terminology, concepts, and careers in the field of exercise science, including first aid principles. Students will evaluate the qualifications and responsibilities of careers in exercise science.

**EXS 123 - Teaching Sport Skills II (3)**

This class builds on what was taught in EXS 103. The purpose of this class is to give the student an understanding of the skills, rules, and strategies for a wide range of sports. The use of proper teaching progressions and techniques will be covered and the students will be asked to write lesson plans and demonstrate their ability to teach. (Sport Management and Exercise Science majors/minors only.)

Prerequisite: Sport Management and Exercise Science majors/minors only.

**EXS 131 - First Aid (1)**

Classroom discussion and practical application of basic first aid principles. American Red Cross certification available.

**EXS 193 - Personal Training Preparation (3)**

The Personal Trainer Prep Course prepares students to take the American Council on Exercise (ACE) Personal Trainer certification exam. Students learn exercise programming, nutrition planning, and client coaching techniques to promote lasting lifestyle changes and improve posture, flexibility, balance, and overall fitness. Upon completion, students may opt to take the ACE Personal Trainer Exam. This course does not certify individuals as personal trainers.

**EXS 203 - Risk and Sports (3)**

This course examines terminology, legal aspects and risks associated with sports performance and physical activity.

**EXS 211 - Exploring Occupational Therapy (1)**

This interactive course explores the history and development of the occupational therapy profession. Students will be

introduced to the AOTA *Standards of Practice*, as a basis for learning the varying roles of the occupational therapy practitioner. Students will engage in weekly topics that cover areas of occupational therapy by practice setting. By the end of the course, students will be able to articulate occupational therapies scope of practice, differentiate from other health professions, and gain a basic understanding of how dysfunction can impact occupational engagement.

Prerequisite: N/A.

**EXS 212 - Adaptive Physical Education (2)**

Classroom discussion and supervised lab experience that familiarizes students with a general knowledge of adaptive physical education and the inclusion process from assessment to writing I.E.P. goals.

**EXS 213 - Motor Control (3)**

The study of how basic and applied knowledge of motor control underlies and enhances clinical, practical and research skills in those venues served by exercise scientists, physical educators and related health professionals.

**EXS 221 - Officiating (1)**

The study of officiating, rules and regulations of sports.

**EXS 233 - Drug Education (3)**

Examines the effects of alcohol, tobacco, and the "illicit" drugs on the physical, psychological, and social health of the individual. Performance-enhancing drugs are investigated.

**EXS 243 - Athletic Training (3)**

The role of the athletic trainer is examined. Qualifications, relationships and responsibilities of the trainer in relation to the athlete, coach, team physician and community are discussed. Practical application for injury recognition, evaluation, management, and rehabilitation.

**EXS 263 - Motor Learning (3)**

A study of the science of perceptual/motor learning including an understanding of the research in this area and application to the teaching of a variety of motor skills to people of different ability levels. The student should understand the problems that a learner faces in the acquisition of a variety of motor skills, develop a researched-based vocabulary, and have the ability to apply this knowledge by designing a teaching strategy that can assist the learner in this process.

**EXS 273 - Nutrition (3)**

A review of the nature of nutritional needs. Focus will include the function of nutrients in the body, weight control and the importance of balanced diets.

**EXS 283 - Fitness Evaluation Assessment (3)**

Examination of fitness and wellness assessment techniques. Students are expected to demonstrate competencies in a wide variety of testing and assessment procedures for analyzing fitness and wellness levels. Includes submax testing, blood pressure, body fat analysis, strength assessment, nutritional analysis, and individual exercise program development. American College of Sport Medicine protocol is utilized.

**EXS 293 - Biomechanics (3)**

Understand the basic concepts of biomechanics, how they relate to the human body, and make connections between biomechanics and the sub disciplines of exercise science.

**EXS 323 - Performance Nutrition (3)**

This class will equip students with knowledge and an understanding of how nutrition plans a role in athletic performance. Students will learn dietary strategies that enhance exercise and sports performance. Prerequisite: EXS 273

Prerequisite: EXS 273.

**EXS 333 - Kinesiology (3)**

The study of the general body mechanics of the human organism; the activities of the physical education program in their relation to coordination and the proper body mechanics, analysis of movement. Prerequisite: Junior standing or permission of instructor

Prerequisite: Junior standing or permission of instructor.

**EXS 343 - Principles of Human Performance (3)**

The purpose of this course is to explore the concepts of human performance and designing skill specific plyometric, agility and stability programs over a periodization cycle. Prerequisite: Junior standing or permission of instructor

Prerequisite: Junior standing or permission of instructor.

**EXS 353 - Exercise Physiology (3)**

The study of body composition, muscular strength, power and endurance. The response of the cardiovascular and respiratory systems to exercise, and the developmental stages of growth are also explored. Prerequisite: Junior standing or permission of instructor

Prerequisite: Junior standing or permission of instructor.

**EXS 363 - Capstone Experience in Health Sciences I (3)**

The purpose of this class is to prepare seniors in Health Sciences to complete their Capstone Experience successfully. It will introduce them to basic research and statistical concepts that can be used to help them develop and design their own original project and correctly analyze the resulting data. By the completion of the class, students will have designed and selected their basic research program and selected appropriate analysis tools to correctly determine the meaning of the results. Prerequisite: Senior standing or permission of instructor

Prerequisite: Senior standing or permission of instructor.

**EXS 373 - Health Promotion & Problems (3)**

A theoretical and practical exploration of the concepts of disease prevention and health promotion. Topics include alcohol, tobacco and drug abuse, physical fitness, nutrition, chronic and communicable diseases, human sexuality and stress management. (Same as AHS 373)

Crosslisted as: AHS 373.

**EXS 383 - Health Coaching (3)**

This class will equip the student with knowledge and an understanding of protocol to give health and wellness counseling to a wide range of clients based on their health history, personal wellness and fitness goals. Prerequisite: EXS 273. (Same as AHS 383)

Prerequisite: EXS 273. Corequisite: None. Crosslisted as: AHS 383.

**EXS 393 - Advanced Athletic Training (3)**

Builds on experiences gained in EXS 243. Includes prevention, evaluation and treatment of athletic-related injuries. Emphasis given to injury assessment and topics related to sports medicine. Examines relationship of athletic trainers in management and care of injuries and their role as professional allied health practitioners. Prerequisites: BIO 154 or BIO 384, EXS 243

Prerequisite: BIO 154 or BIO 384, EXS 243.

**EXS 3001 - Topics in Exercise Science (1)**

This course is designed to help students explore topics in the exercise science field.

**EXS 3002 - Topics in Exercise Science (2)**

This course is designed to help students explore topics in the exercise science field.

**EXS 3003 - Topics in Exercise Science (3)**

This course is designed to help students explore topics in the exercise science field.

**EXS 3004 - Topics in Exercise Science (4)**

This course is designed to help students explore topics in the exercise science field.

**EXS 403 - Remedial Exercise & Rehabilitation (3)**

Students become familiar with common physical therapy modalities and their use in sports medicine. Where applicable, the following will be covered for each modality: physics, biophysics, effects, power application, indications and contraindication. Safety is emphasized during instruction and practical experience. Prerequisites: BIO 154, EXS 243, EXS 353

Prerequisite: BIO 154, EXS 243, EXS 353.

**EXS 413 - Corrective Exercise (3)**

The purpose of the corrective exercise class is to provide instruction and practice on inhibitory, lengthening, activation, and integration techniques. Prerequisites: EXS 333

Prerequisite: EXS 333.

**EXS 423 - Evaluation of Athletic Injuries (3)**

Specialized course dealing with anatomy, kinesiology, injury symptoms and specific tests to help trainers recognize and evaluate athletic injuries. Prerequisites: EXS 333

Prerequisite: EXS 333. Corequisite: none.

**EXS 433 - Developing Health Promotion Program for Adults (3)**

Presentation and examination of health promotion strategies and programs that emphasize lifestyle behaviors that impact health and wellness. Prerequisite: Junior standing or permission of instructor

Prerequisite: Junior standing or permission of instructor.

**EXS 443 - Therapeutic Modalities (3)**

Explores principles of therapeutic rehabilitation of orthopedic injuries including the role of the athletic trainer in the implementation and supervision of a sound rehabilitation program. Special topics include aquatic therapy, the body's response to healing and exercise, development of exercise programs, development and evaluation of tests, measurement techniques and programs, and applications of therapeutic exercise equipment and supplies. Prerequisites: BIO 154, EXS 243

Prerequisite: BIO 154, EXS 243.

**EXS 453 - Capstone Experience in Health Sciences II (3)**

The Capstone is a comprehensive final project, which demonstrates mastery of pedagogy and knowledge. Integration and synthesis of knowledge, skills, pedagogy, and concepts from the disciplines of physical education, exercise science, health education or sport management will be explored. Emphasis is placed on independent work and the development of a student project. Prerequisite: EXS 363

Prerequisite: EXS 363.

**EXS 471 - Advanced Global Perspectives Health & Wellness (3)**

The Global Understanding in Health and Wellness course is a study abroad trip intended to assist students in the comparative analysis of holistic health and wellness practices between the U.S. and selected countries. The trip will include site visits to holistic health centers, various cultural tours and key visits to international health and Olympic sport facilities. Students will be expected to complete assigned readings on key health and wellness practices in facilities. Students will be expected to complete assigned readings on key health and wellness practices in the U.S. and other countries to understand the interests and concerns of the global health and wellness community. Prerequisites: EXS 473; sophomore, junior, or senior standing with 2.5 GPA

Prerequisite:  EXS 473; sophomore, junior, or senior standing with 2.5 GPA.

**EXS 473 - Global Perspectives Health & Wellness (3)**

The Global Understanding in Health and Wellness course is a study abroad trip intended to assist students in the comparative analysis of holistic health and wellness practices between the U.S. and selected countries. The trip will include site visits to holistic health centers, various cultural tours and key visits to international health and Olympic sport facilities. Students will be expected to complete assigned readings on key health and wellness practices in facilities. Students will be expected to complete assigned readings on key health and wellness practices in the U.S. and other countries to understand the interests and concerns of the global health and wellness community. Prerequisites: sophomore, junior, or senior standing with 2.5 GPA. (Same as AHS 473)

Prerequisite: sophomore, junior, or senior standing with 2.5 GPA  . Crosslisted as: AHS 473.

**EXS 474 - Professional Development in Athletic Training (4)**

Observation of and participation in a field-related experience under the direction of a field supervisor and a University supervisor. Internship opportunities are limited to EXS majors only and must have the approval of the Department Chair.  Prerequisite: EXS 243

Prerequisite: EXS 243.

**EXS 483 - Professional Development in Exercise Science (3)**

Explore and evaluate careers within the exercise science field. Students will be discussing the professional skill set, ethics and documentation within the setting through internship based learning experiences. Provides opportunity to interact with other allied health practitioners. Prerequisites: Advisor approval

Prerequisite: Advisor approval.

**EXS 493 - Strength and Conditioning Preparation (3)**

This class discusses how to apply the various energy systems and principles of exercise prescription, health programming and periodization to the strength and conditioning field. Proper technique with exercises and evaluation tools are incorporated to adequately prepare the student for a career in the strength and conditioning field and The Strength and Conditioning Specialist Certification Exam. Prerequisite: EXS 343 or EXS 333

Prerequisite: EXS 333 or EXS 343.

# FIN-Finance

**FIN 303 - Managerial Finance (3)**

This course is a study of the principles of managerial finance including time value of money, capital budgeting, methods of financing, working capital management, financial statement analysis, and other financial topics. Prerequisites: AC 213, and either MA 253 OR MA 393

Prerequisite: AC 213, and either MA 253 OR MA 393. Corequisite: None. Crosslisted as: None.

**FIN 303H - Managerial Finance (honors section) (3)**

This course is a study of the principles of managerial finance including time value of money, capital budgeting, methods of financing, working capital management, financial statement analysis, and other financial topics. Prerequisites: AC 213, and either MA 253 OR MA 393

Prerequisite:  AC 213 and MA 253.

**FIN 323 - Money & Banking (3)**

This course is a study of the principles of monetary economics. An analysis of the structure and operation of financial institutions and the Federal Reserve System is included. The function of monetary policy within the framework of macroeconomic theory is examined. Prerequisite: ECO 223 or ECO 203

Prerequisite: ECO 223 or ECO 203.

**FIN 343 - International Finance (3)**

This course involves a study of the topics essential to the understanding of international finance. Topics include foreign exchange markets and currency risk, international financial markets, international banking, trade financing, country risk analysis, accounting and taxation issues, capital budgeting, international lending, and borrowing techniques. Prerequisite: ECO 223 OR ECO 203

Prerequisite: ECO 223 OR ECO 203.

**FIN 353 - Personal Finance (3)**

This course is an overview of financing decisions made by individuals for personal financial needs. The course will cover personal financial planning and goal setting, the time value of money, financial institutions, cash flow management and budgeting, controlling and managing debt and credit, major purchases decision-making, identity theft, personal taxes, life and property insurance decision-making, investment basics, foreclosure and bankruptcy, retirement planning, wealth building and career planning.

Prerequisite: MA 113.

**FIN 363 - Venture Finance (3)**

This course examines the venture financing options available for new business startups; emphasizes creating and analyzing financial documents, approaching financial sources, assessing the financing alternatives, selling stock for growing companies, the capital structure decision and managing the financial condition of a new venture. Prerequisite: FIN 303

Prerequisite: FIN 303.

**FIN 373 - Introduction to Econometrics (3)**

This course is designed for the finance and economics students as a continuation of MA 253 (Statistics). Students will first revisit the topics of probability, distributions, and hypothesis testing, exploring these topics more thoroughly. Most of the semester will be devoted to building solid theoretical and practical foundation of econometrics. Students will proceed from the simple regression model onto multiple regression analysis in the context of cross-sectional data, time series data, and finally panel data. Violations and fixes to serial correlation and heteroskedasticity problems will be studied. Students will be asked to demonstrate and apply the concepts studied while carrying out an empirical research project. Prerequisite: ECO 223 or ECO 203, MA 253

Prerequisite: ECO 223 or ECO 203, MA 253  .

**FIN 383 - Risk & Insurance (3)**

This course examines the nature of risk and how it can be managed through multiple options, but primarily through insurance. The course will explore basic principles of risk management and continue with the major forms of insurance and risk

management programs. Students will explore the insurance delivery systems as well as insurance company operations. Students will explore legal principles related to insurance, explore government regulation of insurance, and examine insurance contracts. Life and health plans, personal and commercial policies will all receive attention in this course. Students will be introduced to a number of concepts, programs and insurance policies found in personal and business application. Prerequisite: FIN 303

Prerequisite: FIN 303.

**FIN 393 - Financial Leadership (3)**

This course examines the role of individuals in leadership positions who oversee high level financials in the workplace and/or in non-profit organizations they serve. This course provides students with an overview of how to handle strategy decisions related to a variety of financial, tax, regulatory compliance, and information technology issues. The course will cover strategies, measurement and control systems, financial analysis tools, funding sources, and management improvement tips that will help provide the greatest possible value to the company. Students will discover the key attributes of financial responsibility as a leader and how it extends beyond the area of accounting competency. Students will learn how to find innovative ways to solve problems, and then use change management skills to implement them. Prerequisite: BA 123 or PSY 113 and MA 163 or MA 173

Prerequisite: BA 123 or PSY 113 and MA 163 or MA 173.

**FIN 403 - Investments (3)**

An overview of the security markets, sources of investment information, and the classic process of analyzing and valuing securities is presented. Investment opportunities in a wide variety of financial and real assets are explored. The concept of portfolio theory in terms of risk and return is examined. Prerequisite: FIN 303

Prerequisite: FIN 303.

**FIN 413 - Advanced Managerial Finance (3)**

An analytical approach to financial management of a corporation. Areas covered include: corporate governance, capital budgeting, cost of capital, long term financing, capital structure, dividend policy, working capital management and mergers. Prerequisite: FIN 303

Prerequisite: FIN 303.

**FIN 423 - Portfolio & Wealth Planning (3)**

This course offers a broad approach to wealth management designed to help the student examine the importance of financial planning and develop skills needed to implement a successful financial plan. Students are introduced to basic financial concepts, investment analysis, risk management, portfolio theory, personal finance, saving and wealth accumulation, financial planning, and asset allocation. Students will answer questions from the perspective of a financial planner advising clients at different stages in their lives like: How much should a client need to retire? How should a client accumulate what they need to retire and how long will it last?

Prerequisite: BA 213, FIN 303.

**FIN 473 - Finance Modeling (3)**

Students learn how to build a realistic equity valuation model, utilizing software such as Bloomberg Professional Service and Excel. Students also get experience in managing an investment portfolio, assessing its performance, and employing various risk management techniques. Prerequisites: BA 213, FIN 303

Prerequisite: BA 213, FIN 303.

**FIN 493 - Topics In Finance (3)**

Offered to examine specific or current business or special financial issues. Possible examples could include asset management, corporate financing, securities analysis and management of financial institutions. Prerequisite: FIN 303

Prerequisite: FIN 303.

**FIN 5063 - Corporate Finance (3)**

This course focuses on the financial management of both publicly held and private corporations. Students are presented with a conceptual framework for addressing problems commonly faced by corporate decision makers and are provided opportunities to apply these concepts to contemporary business situations. Topics covered include but are not limited to: time value of money, the relationship between risk and return including the capital asset pricing model, the valuation and role of debt and equity, capital budgeting/project evaluation techniques, cost of capital, cash flow estimation, project risk analysis, real options, company valuation, and capital structure decisions.

Prerequisite: None.

**FIN 5203 - Finance for Engineers (3)**

This course is a study of managerial finance decision-making for engineers. Students will gain a deep knowledge of the economic viability of engineering decisions and learn an appropriate balance between design alternatives, resulting costs, and their impact on enterprise. Students will learn applied measurable concepts to maximize efficiency and competitive advantage.

**FIN 5823 - Financial Modeling (3)**

Students will build robust financial forecasts using financial modeling techniques, interpret the results, and learn to strategically communicate with decision makers in organizations. Areas covered include forecasting financial statements, estimating cost of capital, equity valuation analysis, and capital budgeting. Students will use sensitivity analysis and simulation techniques in modeling risk and explore the basics of portfolio models.

**FIN 5833 - International Finance (3)**

This course will cover issues related to economies in the global environment, international financial markets, and international financial management. Throughout the course, students will learn the basic issues of the macro-economy and issues related to balance of payments between national economies. Additionally, the course focuses on the international financial markets, specifically the foreign exchange market, the international money markets, and the conditions that define their interrelation. Finally the course will consider issues associated with the operation of a firm in the global environment, including exchange rate risk management, international portfolio investing and international project evaluation and financing. Key corporate financial issues will be explored including exchange rate exposure, taxation, securities pricing, the cost of capital, and the evaluation of foreign projects. Prerequisites: Graduate standing

Prerequisite: Graduate standing.

**FIN 5843 - Financial Markets & Institutions (3)**

This course is an in-depth study of the U.S. money and capital markets, and institutions. The course examines regulation of the financial industry and the role of financial instruments.

Prerequisite: Graduate standing.

**FIN 5853 - Investment Analysis & Portfolio Management (3)**

This course requires students to evaluate the mechanics of securities markets, types of available investments, and an introduction to determination of securities values. Problems of investment policy are approached through studies of portfolio selection, performance evaluation, and risk management methods.

Prerequisite: None.

**FIN 6923 - Managerial Accounting & Finance (3)**

This course is an introduction and examination of essential accounting and finance principle, teaching students how to use

accounting and financial information for effective decision making, planning, and controlling the operations of business enterprises. Significant emphasis is placed on corporate finance, introducing financial markets and institutions, asset valuation, and the relationships between risk and return. Other topics include break-even analysis and pricing, product cost systems, capital budgeting, and cost-volume-profit analysis.

# FIT-Fitness

**FIT 1001 - Speed and Agility Training (1)**

Development of flexibility, quickness, agility, and overall athletic speed.

**FIT 2011 - Coaching Internship (1)**

The course involves a meaningful work experience related to student's field of study or other functional areas of coaching in an approved program. The assignment and company must be approved by the Athletic Director. A maximum of 3 semester hours can be counted toward degree requirements, with a maximum of 3 credit hours for any one work session.

**FIT 2012 - Coaching Internship (2)**

The course involves a meaningful work experience related to student's field of study or other functional areas of coaching in an approved program. The assignment and company must be approved by the Athletic Director. A maximum of 3 semester hours can be counted toward degree requirements, with a maximum of 3 credit hours for any one work session.

**FIT 2013 - Coaching Internship (3)**

The course involves a meaningful work experience related to student's field of study or other functional areas of coaching in an approved program. The assignment and company must be approved by the Athletic Director. A maximum of 3 semester hours can be counted toward degree requirements, with a maximum of 3 credit hours for any one work session.

**FIT 2101 - Walking/Jogging (1)**

Introduction to power walking and the fundamentals of jogging.

**FIT 2111 - Racquet Sports (1)**

Introductory look at rules, skills, strategy, and etiquette of tennis, racquetball, badminton, and table tennis.

**FIT 2121 - Learn to Ice Skate (1)**

This course is designed to help students learn to ice skate. The students will gain an understanding of skills and safety components in ice skating.

**FIT 2131 - Golf/Bowling (1)**

Introduction to the proper etiquette and fundamentals of golf and bowling. Service fee will be added for course enrollment.

**FIT 2151 - Social Board Games (1)**

The objective of this activity class is to expose the students to the history, rules, strategies and fundamentals of a variety of social board games including Chess, Checkers, Backgammon, Cranium, Scrabble, Trivial Pursuit, Pictionary, Taboo, and Monopoly.

**FIT 2171 - Pilates (1)**

Pilates workout for students designed to teach students the fundamental movement patterns and exercises associate with Pilates. This course will help build balance, strength, and coordination.

**FIT 2191 - Wrestling (1)**

The objective of this activity class is to improve the student's knowledge of the skills and strategies of wrestling through a variety of drills and games.

**FIT 2221 - Golf I (1)**

The course is an introduction to the game of golf. Golf history, terminology, rules, and etiquette will be introduced. The student will gain the golf skills (swing, pitching, chipping, and putting) to play a 9-hole round of golf.

**FIT 2241 - Bowling (1)**

Introduction to the proper etiquette and fundamentals of bowling. This activity class is designed to improve the student's knowledge of the skills and strategies of bowling through a variety of drills, exercises, and games. Grading is on a (S) Satisfactory or (U) Unsatisfactory basis.

**FIT 2271 - Conditioning (1)**

Development of cardiovascular and strength conditioning. Course will meet three days a week or the equivalent of three hours per week.

**FIT 2281 - Strength & Training for Hockey (1)**

The course is designed to help students learn how to develop and participate in strength and conditioning programs for hockey.

**FIT 2331 - Indoor/Outdoor Soccer (1)**

The objective of this activity class is to improve the student's knowledge of the skills and strategies of indoor and outdoor soccer through a series of drills and games.

**FIT 2341 - Lacrosse (1)**

The objective of this activity class is to introduce the game of lacrosse, its history, the skills, and the strategy of the game.

**FIT 2351 - Karate (1)**

Introduction to the fundamentals, skills, and rules of karate.

**FIT 2361 - Ballroom Dancing (1)**

The objective of this activity class is to expose the student to a number of social dances including the fox trot, waltz, tango, salsa and swing. The proper steps, form, and coordination with the music will enhance the student's confidence on the dance floor.

**FIT 2371 - Volleyball (1)**

The objective of this activity class is to improve the student's knowledge of the skills, rules and strategies of men's and women's volleyball through a variety of drills, games and tests.

**FIT 2381 - Basketball (1)**

The objective of this activity class is to improve the student's knowledge of the skills and strategies of basketball through a series of drills and games.

**FIT 2391 - Ice Hockey (1)**

The objective of this activity class is to improve the student's knowledge of the skills and strategies of ice hockey through a series of drills and games.

**FIT 2411 - Yoga (1)**

This course is designed to teach students the fundamental movement patterns and exercises associated with yoga. This course will help build balance, strength, and flexibility.

**FIT 2421 - Introduction to Broomball (1)**

An introduction to basic broomball skills. Designed for those who have never played broomball, students with limited

broomball experience, or students with broomball experience but no formal instruction.

Prerequisite: NA. Corequisite: NA. Crosslisted as: NA.

**FIT 2431 - Beginner Bridge (1)**

The objective of this activity class is to expose the students to the social, international card game – Bridge. This course is not suitable for students who have previously played Bridge. Those who enjoy Euchre and/or other "trick taking" card games will find Bridge to be enjoyable.

Prerequisite: NA. Corequisite: NA. Crosslisted as: NA.

**FIT 4001 - Special Projects in Fitness (1)**

Credit earned through directed reading, independent study, research or supervised lab or field work. Maximum three hours credit. Prerequisite: Permission of the Department Chair

Prerequisite: Permission of the Department Chair.

**FIT 4002 - Special Projects in Fitness (2)**

Credit earned through directed reading, independent study, research or supervised lab or field work. Maximum three hours credit. Prerequisite: Permission of the Department Chair

Prerequisite: Permission of the Department Chair.

**FIT 4003 - Special Projects in Fitness (3)**

Credit earned through directed reading, independent study, research or supervised lab or field work. Maximum three hours credit. Prerequisite: Permission of the Department Chair

Prerequisite: Permission of the Department Chair.

# FLM-Film

**FLM 203 - Film Appreciation (3)**

This course introduces students to basic film history and elements of film form including cinematography, mise-en-scene, acting, editing, and sound. Through lectures and readings students are exposed to basic cinema vocabulary and various approaches to narrative form and film type. Film screenings of both classic and contemporary films are used to introduce approaches to film criticism. Corequisite: Lab Required

Corequisite: Lab Required.

# FPY-Forensic Psychology

**FPY 603 - Theory & Practice of Forensic Psychology (3)**

A study of the fundamental elements encompassing the practical and research application of forensic psychology. Students will examine the variables associated to: (a) ethical issues, (b) psychological assessment, (c) police and correctional psychology, (d) child custody evaluations, (e) trial consultation procedures, (f) criminal investigative techniques, (g) eyewitness memory, and (h) insanity pleas and competency evaluations. Prerequisite: Must be admitted to either the MSCJ or Certificate Program

Prerequisite: Must be admitted to either the MSCJ or Certificate Program.

**FPY 613 - Psychopathology (3)**

Throughout this course, students will conduct an in-depth analysis of mental illness and its association with criminal behavior. Students will identify patterns of psychopathy and sociopathy. Various disorders will be examined. Students will apply

knowledge learned to determine the causation of crime. Students in this course will also examine the DSM-V in relation to criminal behavior.

**FPY 623 - Evaluation & Treatment of Special Populations (3)**

This course provides an overview of the methods and modalities utilized to assess and treat sex offenders, substance abuse offenders, juveniles, and domestic violence perpetrators. Students will concentrate on each classification and interrelationships associated to application, treatment, assessment, and evaluation of the variables accompanying each classification. Prerequisite: Must be admitted to either the MSCJ or Certificate Program

Prerequisite: Must be admitted to either the MSCJ or Certificate Program.

**FPY 643 - Victimology (3)**

This course involves the study of victims and witnesses of crime. An emphasis will be placed on the psychological and emotional detriments associated with being victimized and the classification of the types of victims. Students will learn how to apply criminological theory to address why offenders choose their victims. Additionally, students will examine a victim's reaction to crime.

Prerequisite: None.

**FPY 693 - Forensic Psychology Demonstration Project (3)**

An in-depth analysis and synthesis of the concepts contained within the concentration courses. Conducted under the direction of a criminal justice faculty member the student will design and implement a capstone project, and the present the results to a committee of two full-time or adjunct professors who specialize in criminal justice and/or forensic psychology. Prerequisite: CRJ 593, Must be taken in the final term of the MSCJ or Certificate Program, and may be taken with one other MSCJ course

Prerequisite: CRJ 593, Must be taken in the final term of the MSCJ or Certificate Program, and may be taken with one other MSCJ course.

# FRN-French

**FRN 113 - French I (non-native speakers) (3)**

An introduction to the French language with an emphasis on reading and writing in French. Vocabulary development and the basics of French structure are also covered. No previous study of French is required. NATIVE SPEAKERS OF FRENCH MAY NOT REGISTER FOR FRN 113

**FRN 123 - French II (3)**

A continuation of French 113, integrating listening, speaking, and reading, and writing skills. Basic grammar and French cultures are covered. Prerequisite: FRN 113

Prerequisite: FRN 113.

# FS-Forensic Science

**FS 203 - Principles of Forensic Science I (3)**

This course is designed as an introduction and overview of the various branches of forensic science such as pathology, toxicology, anthropology, and entomology, and how the various fields play a part in the criminal justice system as they relate to the collection and analysis of crime scene evidence. General topics in forensic science, such as ethics, crime scene investigation procedures, and law will be discussed. Prerequisite: BIO 114

Prerequisite: BIO 114.

**FS 223 - Principles of Forensic Science II (3)**

This course is a continuation of FS 203. It is designed to introduce the principles of the forensic science laboratory including such topics as microscopy, DNA techniques, latent print analysis, controlled substance analysis, and informatics. Prerequisite: FS 203

Prerequisite: FS 203.

**FS 343 - Criminalistics & Crime Scene Investigations (3)**

Throughout this course, students will explore basic concepts from the field of forensic science including how math and science are used in the collection and analysis of evidence. Terminology, criminalistic processes, and the importance of proper evidence handling will also be studied. Additionally, students will identify the significance of evidence collection and how evidence is interpreted in the justice system. Same as CRJ 343.

Crosslisted as: CRJ 343.

**FS 351 - Criminalistics & Crime Scene Laboratory (1)**

A laboratory course which explores the basic techniques of collecting and analyzing evidence taken from crime scenes. (Same as LE 351) Prerequisite: FS 343 or LE 343

Prerequisite: FS 343 or LE 343. Crosslisted as: LE 351.

**FS 373 - Forensic Comparative Science (3)**

An introduction to the examination process of comparative science evidence. The philosophical study presented will provide the foundation for the student to judge sufficiency of details when determining the source of crime scene evidence. Practical comparative exercises of fractures and tears, firearm and tool marks, finger and palm print, and shoe and tire print examinations, will be included within the class. The class will be approximately half lecture and half examination exercises. Prerequisite: FS 203

Prerequisite: FS 203.

**FS 422 - Expert Testimony in Forensic Science (2)**

Consideration of a scientist's role in courtroom testimony, communication of scientific data to the general public, courtroom demeanor, trial preparation, and mock trial experiences. Prerequisite: Senior standing in forensic science program or permission of the Department Chair, SP 203

Prerequisite: Senior standing in forensic science program or permission of the Department Chair, SP 203.

# GE-General Engineering

**GE 101 - Introduction To Engineering (1)**

This course is required for all freshman engineering students. Its purpose is to improve student success, to make the college experience more relevant to career goals, and to help students obtain as much assistance from the University as possible while working towards their engineering degrees. The course will cover community building, academic goals, effective learning methods, University orientation, and personal and professional development.

Prerequisite: none. Corequisite: none.

**GE 113 - Introduction to Engineering Design (3)**

Fundamental concepts of engineering design and development are introduced. Teams of students investigate an engineering problem, research alternative solutions, develop a design, and build and evaluate a prototype.

**GE 171 - Special Topics in Engineering (1)**

This course will be offered an on as-needed basis, and the topics and credit hours will depend on the need.

**GE 203 - Introduction to GIS (3)**

This course introduces Geographic Information Systems (GIS). It includes essential concepts, spatial data types, basic and advanced spatial analysis, cartography, data visualization, and real-world applications across various disciplines. The course, which includes hands-on experiences with GIS software, emphasizes the integration of theoretical knowledge with practical applications. Prerequisite: Sophomore standing or permission of the instructor

Prerequisite: Sophomore standing or permission of the instructor.

**GE 301 - Engineering Internship (1)**

This course involves a meaningful work experience related to the student's field of study in engineering. The Engineering Internship Coordinator must approve the assignment and company. This course may be taken to a maximum of three credit hours. Prerequisites: Engineering major, 2.5 GPA, junior standing, and permission of the Department Chair. Prerequisites: Engineering major, 2.5 GPA, junior standing, and permission of the Department Chair.

Prerequisite: Prerequisites: Engineering major, 2.5 GPA, junior standing, and permission of the Department Chair.

**GE 302 - Engineering Internship (2)**

This course involves a meaningful work experience related to the student's field of study in engineering. The Engineering Internship Coordinator must approve the assignment and company. This course may be taken to a maximum of three credit hours. Prerequisites: Engineering major, 2.5 GPA, junior standing, and permission of the Department Chair. Prerequisites: Engineering major, 2.5 GPA, junior standing, and permission of the Department Chair.

Prerequisite: Prerequisites: Engineering major, 2.5 GPA, junior standing, and permission of the Department Chair.

**GE 303 - Engineering Internship (3)**

This course involves a meaningful work experience related to the student's field of study in engineering. The Engineering Internship Coordinator must approve the assignment and company. This course may be taken to a maximum of three credit hours. Prerequisites: Engineering major, 2.5 GPA, junior standing, and permission of the Department Chair. Prerequisites: Engineering major, 2.5 GPA, junior standing, and permission of the Department Chair.

Prerequisite: Prerequisites: Engineering major, 2.5 GPA, junior standing, and permission of the Department Chair.

**GE 313 - SPC & Lean Manufacturing (3)**

This course provides the knowledge needed to effectively use Statistical Process Control (SPC). The relationship to quality costs, on-time delivery, concepts of variation, and an analysis of the organization-specific SPC applications will be introduced. Utilizing SPC to improve and maintain consistent production will be covered. The use of Lean manufacturing to shorten the time between the customer order and the product build/shipment by eliminating sources of waste will also be covered through the study of system performance, identification and elimination of waste, elimination of sources of variability, and a good understanding and use of the principles of operations management. Prerequisite: MA253 or equivalent introductory statistics course.

Prerequisite: MA253 or equivalent introductory statistics course.

**GE 401 - Professional Practice (1)**

This course covers the two broad areas of professional practice. The first consists of topics pertinent to career aspects of the profession: job search activities, graduate school information, lifelong learning, professional registration, and the role of professional societies. The second area concerns the social responsibilities of the practicing professional engineer: professional ethics, the role of engineering in public policy, the need for knowledge of current affairs, and consideration of the impact of technology upon society. Prerequisite: Junior standing in engineering

Prerequisite: Junior standing in engineering.

**GE 403 - Engineering Project (3)**

A design or capstone project, with industrial or real-world application, producing all necessary and appropriate documentation, and if applicable, models, and prototypes. The project should entail a minimum of 3 hours of work per week. The project must be pre-approved by the Dean for the College of Graduate and Professional Studies and/ or a PE certified faculty member from the school.

Prerequisite: The project must be pre-approved by the Dean for the College of Graduate and Professional Studies and/ or a PE certified faculty member from the school.

**GE 413 - Design of Experiments (3)**

This course will highlight optimization and improvement of products or manufacturing processes by using statistical techniques to design and analyze experiments. The concepts of factorial and fractional factorial designs of experiments will be introduced. Six Sigma and Lean applications of Microsoft Excel and Minitab software programs for hypothesis testing, analysis of variance, and measurement systems analysis will also be covered. Prerequisite: MA253 or equivalent introductory statistics course.

Prerequisite: MA253 or equivalent introductory statistics course.

**GE 5093 - Design Thinking (3)**

This course will shape the principles and strategies of creative design and provide a path for students to identify and develop the creative potential required to transform how we identify and solve problems. Solutions for business and society are not merely the domain of creative types, the methods demonstrated within this curriculum will provide students the confidence and opportunity required to illustrate and implement the creative design solutions required for the future.

**GE 5103 - Project Management (3)**

The course examines project management from the strategic and operational point of view. Project management principles and methodology are covered with special focus on planning, scheduling, controlling, and coordinating individual and group efforts. Project management tools such as the critical path and Gantt charts will be reviewed as well as methods for controlling the four most important elements of any project: scope, time, cost, and resources. The course will focus on project management in manufacturing and industrial settings.

**GE 5113 - New Product Development & Innovation Strategies (3)**

Students will be introduced to industry-standard new product and process development processes, tools, and methodologies. An emphasis is placed on the deployment of new product and process design tools as well as analysis of the new product and process development process in real world applications. Students will enhance their abilities to lead and manage cross-functional new product and process design and development teams in engineering organizations.

**GE 5133 - Lean Six Sigma (3)**

This course will cover statistical Six-Sigma driven Lean Enterprise methodologies to enhance organizational processes and customer defined value to achieve most efficient product cost. Other synergetic methodologies to integrate world-class best practices of engineering and manufacturing leading to operational excellence through cross-functional tam work and continuous improvements to achieve customer satisfaction and improved profitability will also be discussed. Real-world case studies and problem-solving exercises will be offered as needed to help reinforce the knowledge and concepts involved. Prerequisite: Graduate standing

Prerequisite: Graduate standing.

**GE 5163 - Engineered Quality (3)**

This course offers a broad view of Quality Engineer foundations to reinforce management and leadership within the Quality Management System (QMS). The focus aligns process efficiency and total quality management to generate the highest

customer value. Various topics are reviewed including: Cost of Quality (COQ), ISO, auditing guidelines, product and process design, material control, metrology, acceptance sampling, reliable Measurement Systems and Analysis (MSA), preventative/corrective actions, process control improvement tools and hazard identification. Students have the ability to utilize this coursework to apply for the Certified Quality Engineer Exam. Prerequisite: Graduate standing

Prerequisite: Graduate standing.

**GE 5213 - Total Quality Management (3)**

This course provides a detailed overview of quality control and improvement systems that are based on Total Quality Management (TQM) principles. Topics related to design and implementation of quality-related procedures, related technologies, and the impact on organizations are also covered.

**GE 6963 - Engineering Management Capstone (3)**

This course is designed to reinforce learning objectives found throughout the Master of Science in Engineering Management (MSEM) program. Students will apply engineering management concepts to a real-world project which will be presented at the conclusion of the course. Prerequisite: To be taken in the final term of the MSEM program

Prerequisite: Final term of MSEM program.

# GEO-Geography

**GEO 213 - Physical Geography (3)**

An analysis of the spatial and functional relationships among landforms, climates, soils, water, and the living world. This course also addresses the connections between environmental processes and human activity, such as human impact on the environment. (Same as EAS 213)

Crosslisted as: EAS 213.

**GEO 303 - Human Geography (3)**

Topical studies to show how human beings have altered and adapted to their physical environments over time through technology, migration, and demographic changes. Focus is on cultural identity and landscape, cultural interaction, and conflict. Prerequisite: Junior standing or permission of instructor

Prerequisite: Junior standing or permission of instructor.

**GEO 313 - Geography of North America (3)**

A regional approach to the United States and Canada. An in-depth look at economic, political, historical, and cultural developments in the content of the physical environment. Focus on the present and the future of each region, as well as how those futures are intertwined. Global context is also considered. Prerequisite: Junior standing or permission of instructor

Prerequisite: Junior standing or permission of instructor.

**GEO 323 - World Geography (3)**

Throughout this course students will explore the cultural regions of the world. Students will analyze how human social development can be impacted by the physical environment in which humans live. Additionally, students will discover the economic, cultural, historical, and political influences different regions of the world have on human social development.

**GEO 4001 - Readings In Geography (1)**

Credit earned through directed reading, independent study, research or supervised field work. Maximum four hours credit. Prerequisite: Permission of Department Chair

Prerequisite: Permission of Department Chair.

**GEO 4002 - Readings In Geography (2)**

Credit earned through directed reading, independent study, research or supervised field work. Maximum four hours credit. Prerequisite: Permission of Department Chair

Prerequisite: Permission of Department Chair.

**GEO 4003 - Readings In Geography (3)**

Credit earned through directed reading, independent study, research or supervised field work. Maximum four hours credit. Prerequisite: Permission of Department Chair

Prerequisite: Permission of Department Chair.

**GEO 4004 - Readings In Geography (4)**

Credit earned through directed reading, independent study, research or supervised field work. Maximum four hours credit. Prerequisite: Permission of Department Chair

Prerequisite: Permission of Department Chair.

# GER-German

**GER 104 - German I (non-native speakers) (4)**

Introduction to the German language and culture. Pronunciation, conversation and basic grammar skills are stressed. No previous study of German is required.

**GER 114 - German II (4)**

Continues conversation and grammar skills. Additional emphasis on reading and writing. Prerequisite: GER 104 or permission of the instructor

Prerequisite: GER 104 or permission of the instructor.

**GER 203 - German III (3)**

An intermediate German class with an emphasis on reading and writing skills and grammar review. Students read selected original literary texts by German authors and write short paragraphs related to the texts. Conversational skills are also emphasized. Prerequisite: GER 114 or permission of the instructor

Prerequisite: GER 114 or permission of the instructor.

**GER 213 - German IV (3)**

A continuation of German III with an emphasis on reading and writing skills and grammar review. The difficulty level of the reading selections increases in this course. Prerequisite: GER 203 or permission of the instructor

Prerequisite: GER 203 or permission of the instructor.

# GLY-Geology

**GLY 271 - Geology Laboratory (1)**

An introductory laboratory study of basic physical geology. The laboratory emphasizes skills needed for the identification of minerals and rocks, for the interpretation of land surface features based on topographic maps and for the understanding of folding, faulting, and rock relationships Trine University 351 through the interpretation of geologic maps. Corequisite or Prerequisite: GLY/EAS 273 (same as EAS 271)

Prerequisite: GLY 273. Crosslisted as: EAS 271.

**GLY 273 - Geology (3)**

An introduction to the field of geology. Study of minerals and rocks and their formation within the context of the earth's geologic history. Emphasis on soils, running water, and groundwater. Plate tectonics, glaciers, volcanoes, erosion, and weathering are also covered. (Same as EAS 273)

Crosslisted as: EAS 273.

# GM-Golf Management

**GM 131 - Player Development I (1)**

This course is designed to promote game improvement, further explore teaching methodology, and improve technical game skills for Golf Management Majors. Prerequisite: Golf Management Major or Minor

Prerequisite: Golf Management Major or Minor.

**GM 203 - Golf Shop Management (3)**

This is an introduction to the management of various types of golf facilities. Topics of study include Business Planning, Personnel Management, Tournament and Handicapping Operations, Golf Car Fleet Operations, Merchandising and Inventory Management and Customer Relations. Prerequisite: Golf Management Major or Minor

Prerequisite: Golf Management Major or Minor.

**GM 213 - Club Design, Repair & Fitting (3)**

This course gives students a historical perspective on club design. Students then have opportunity to learn basic club repair and fitting techniques using various industry tools and methodologies. Prerequisite: Golf Management Major or Minor

Prerequisite: Golf Management Major or Minor.

**GM 223 - Promotion & Marketing of Golf Facilities (3)**

This is a study of the various tools and techniques in golf facility promotion. Social media, traditional advertising mediums, special promotions, sales, brochures, tournaments, fund-raisers, and other advertising opportunities are explored. Students determine target markets for various golfing functions that align with the overall business plan for the facility. Prerequisite: GM 203

Prerequisite: GM 203.

**GM 231 - Player Development II (1)**

This course designed to promote game improvement, further explore teaching methodology, and improve technical game skills for Golf Management Majors. Prerequisite: GM 131

Prerequisite: GM 131.

**GM 233 - Internship (3)**

Students will be assigned to golf courses or golf facilities to gain experience in golf operations and management. The term of each internship will vary from three to ten weeks, depending on the nature of the position and responsibilities. Prerequisite: GM 203

Prerequisite: GM 203.

**GM 303 - Teaching the Short Game (3)**

This is a comprehensive study of the methods of teaching and executing the chip shot, the pitch shot, putting, and bunker play. Students will have opportunities to conduct lessons to demonstrate their teaching style. Golf management majors only.

Prerequisite: GM 203

Prerequisite: GM 203.

**GM 323 - Teaching the Golf Swing (3)**

This course examines the principles and theories of golf instruction. Study examines terminology, teaching approaches and styles, practice drills and exercises, teaching aids, and other related areas in the teaching of the swing. Students explore teaching styles for individual and group instruction, golf schools, and demonstrations. Golf management majors only. Prerequisite: GM 203

Prerequisite: GM 203.

**GM 331 - Player Development III (1)**

This course designed to promote game improvement, further explore teaching methodology, and improve technical game skills for Golf Management Majors. Prerequisite: GM 231

Prerequisite: GM 231.

**GM 343 - Golf Facility Operations (3)**

Students will study the grassroots of golf facilities: agronomy, course architecture, construction (including irrigation, drainage, and contouring), and structural facilities (maintenance barns, pro shop, dining areas, practice areas, driving ranges, golf car storage, etc.). The relationships between inside and outside operations at golf facilities will also be examined. Prerequisite: GM 203

Prerequisite: GM 203.

**GM 411 - Food & Beverage Management (1)**

This course is an introduction to food and beverage industry, including operations and legal issues. Food and beverage service levels at golf facilities will be examined from concessions all the way up to fine dining. Prerequisites: GM 203

Prerequisite: GM 203.

**GM 431 - Player Development IV (1)**

This course designed to promote game improvement, further explore teaching methodology, and improve technical game skills for Golf Management Majors. Prerequisite: GM 331

Prerequisite: GM 331.

**GM 452 - Golf Management Leadership (2)**

This course integrates information in other Golf Management classes to allow students to develop unique leadership styles and methods. Students will also develop a portfolio, revise resumes and cover letters, and apply/interview, for careers upon graduation. Prerequisite: GM 203

Prerequisite: GM 203.

**GM 462 - Senior Seminar in Golf Management (2)**

This course will provide students with a framework for using critical thinking skills to integrate concepts, theories, and methods of inquiry presented through general education and Golf Management studies. Through reading, exercises, self-assessments, presentations, and teamwork, students will learn more about meaningful career options, challenges they will face, and how to plan for advancement and success. Prerequisite: GM 203 and GM 323

Prerequisite: GM 203 and GM 323.

**GM 4001 - Research Topics Golf Management (1)**

Special studies of topics related to golf management conducted in independent study under the direction of the staff. May be taken in conjunction with internships, and may be taken for variable credit, for a maximum of four credits.

**GM 4002 - Research Topics Golf Management (2)**

Special studies of topics related to golf management conducted in independent study under the direction of the staff. May be taken in conjunction with internships, and may be taken for variable credit, for a maximum of four credits.

**GM 4003 - Research Topics Golf Management (3)**

Special studies of topics related to golf management conducted in independent study under the direction of the staff. May be taken in conjunction with internships, and may be taken for variable credit, for a maximum of four credits.

**GM 4004 - Research Topics Golf Management (4)**

Special studies of topics related to golf management conducted in independent study under the direction of the staff. May be taken in conjunction with internships, and may be taken for variable credit, for a maximum of four credits.

# GS-General Studies

**GS 4003 - Senior Capstone Project (3)**

Throughout this course, students will demonstrate the integration of the two to three academic programs they have chosen for the self-directed general studies program. The project will include an oral presentation and a researched paper that evaluates the rationale for the programs selected. A series of scaffolded activities and assignments will prepare students to present their project both in written and oral formats. Prerequisite: Senior standing

Prerequisite: Senior standing.

# HC-Healthcare Management

**HC 203 - US & World Healthcare Systems (3)**

This course sets the foundation of our healthcare system. The course content helps the student understand systems thinking as it applies to the multiple segments of public, community and academic centered health. Each of these care delivery components are discussed, as well as their functional relationship. Throughout the course, contrasts and comparisons are made to the international delivery of medical care.

**HC 213 - Healthcare Market Analysis (3)**

Analysis of healthcare strategic planning is explored. Utilizing a mission driven approach, strategic planning is assessed, identifying internal and external strengths and weaknesses of the healthcare market. Learners apply critical thinking to analyze and leverage the position of stakeholders. Learners research and develop marketing concepts designed to assist in the implementation of a strategic plan.

**HC 273 - Healthcare Billing and Coding (3)**

This course introduces the fundamentals of medical billing and coding. Students will recognize the association between the delivery of healthcare services and the need to appropriately secure reimbursement. An emphasis will be placed on the development of coding skills using government mandated coding systems and other reimbursement methods and medical insurance concepts.

Prerequisite: None. Corequisite: None. Crosslisted as: None.

**HC 303 - History of American Healthcare (3)**

This course is an introductory course in healthcare management. The course will present the history of healthcare systems in

America from the late 1800's through the present day. Emphasis will be placed on an understanding of key historical forces which have shaped new millennium models of the American healthcare delivery system.

**HC 313 - Professional Relationships (3)**

This course focuses on the development of professional relationships in a health care setting. Topics include networking, effective communication and personal success.

**HC 323 - Technology and Clinical Systems (3)**

This course provides an overview of technologies that support modern healthcare systems and the application of major information systems, methodologies, and administration. Students will learn the foundation for improvements in healthcare efficiency, quality, and healthcare outcomes associated with technology.

**HC 333 - Management Techniques & Principles (3)**

This course will offer a variety of industrial management techniques applicable to department-level projects within a healthcare facility. The course will incorporate projects and statistical analysis of current operations. Hospital ancillary support departments as well as direct patient care departments will be reviewed. Recommendations for improvement will be derived from the analysis of workflow data and other internal information sources. The course addresses the overall management of a healthcare facility and explores issues such as how to determine what is broken in the organization, prioritization of changes or improvements, long-term impact of current problems, and response strategies to internal and external forces. Prerequisite: MA 253

Prerequisite: MA 253.

**HC 363 - Information Systems Strategies (3)**

This course identifies leadership skills to apply to management and decision making of health information technology. The focus is on clinical, business, financial and the strategic use of medical information technology. The use of medical technology to mitigate risk and errors in medical care delivery is explored. Given the rapid change in health informatics the use and application of the newest technology is continuously updated so that the student is equipped to lead in today's business and medical informatics application.

**HC 413 - Healthcare Accounting (3)**

This course introduces the student to accounting specifically related to the health care industry. Audit procedures, insurance (including Medicare and Medicaid) reimbursement, fund accounting, government and grant accounting are also covered. This course uses computer applications. Prerequisite: AC 213

Prerequisite: AC 213.

**HC 423 - Healthcare Finance (3)**

An analytical approach to financial management of a corporation. Areas covered include: Operating and capital budgets, capital purchases, cost benefit analysis and break-even analysis, financial statement analysis and the financing of facilities. The course is considered the second course and continuation of Managerial Finance with a specialization in health care issues. Prerequisite: FIN 303, HC 413

Prerequisite: FIN 303, HC 413.

**HC 433 - Applied Finance & Revenue Cycle (3)**

In healthcare, corporate financial principles and the revenue cycle are integrally tied. This course provides an in-depth examination of the critical components of healthcare financial operations. The content of this course includes the regulatory and legal aspects in understanding the finance issues of corporate compliance. Course content provides the understanding that a student will need to be an effective leader in financially managing their area of operational responsibility.

**HC 443 - Healthcare Delivery Systems (3)**

This course will evaluate and describe various financing mechanisms available within the healthcare industry. Issues related to insurance and managed care will be explored. The ongoing problem of healthcare availability and accessibility in the United States will be reviewed. The impact of economics, national health status statistics and public policy legislation affecting the U.S. healthcare system will be discussed. A research paper related to the current status of the healthcare delivery system of a foreign country will be required.

**HC 463 - Effective Quality Management (3)**

The history of healthcare quality is explored including the reduction of medical errors. A working knowledge is gained of the application of quality tools used for organizational improvement. Understanding the principles of reimbursement that will impact value-based quality systems of care to Lean and Six Sigma implementation is included in this course of study.

**HC 473 - Healthcare Capstone (3)**

The healthcare administration capstone represents an exercise in the culmination of knowledge gained in this entire course of study. Based on a case study approach real world simulation occurs affording the student an ability to manage and evaluate complex healthcare business problems and opportunities. The student is challenged with exercises of qualitative and quantitative analysis as well as a high level of critical thinking skills that would be needed as a healthcare leader. Prerequisites: All required coursework in Health Care Administration core

Prerequisite: All required coursework in Health Care Administration core.

**HC 6803 - Leadership & Management Healthcare Systems (3)**

This course is an in-depth study of a range of issues and related problems faced by practicing managers and leaders in the rapidly changing healthcare/health services delivery system. Special emphasis is placed on the issues relevant to current challenges, and this emphasis is of utilitarian value to the participants. Examples of issues include rural and urban healthcare, managed care, ethics of healthcare, integrating technology, and leadership styles and traits. Prerequisites: All LDR Core (5000-level) courses OR admission to non-degree graduate certificate program

Prerequisite: All LDR Core (5000-level) courses OR admission to non-degree graduate certificate program.

**HC 6823 - Legal & Ethical Issues in Healthcare Leadership (3)**

The course studies the legal framework of health Services and healthcare delivery, as well as the ethical issues confronted by healthcare administrators in various healthcare settings. Topics will include licensure, medical malpractice, liability, insurance issues, legal standards for care, confidentiality of records (HIPAA), informed consent, and patient rights and patient advocacy. Prerequisites: All LDR Core (5000-level) courses OR admission to non-degree graduate certificate program

Prerequisite: All LDR Core (5000-level) courses OR admission to non-degree graduate certificate program.

**HC 6843 - Organization & Economics of Healthcare Delivery Systems (3)**

The course provides an overview of the development of the current status of the healthcare system in the United States, its organizational structure, and operation of the various healthcare organizations, governmental as well as non-governmental, at the federal, state, and local levels. The course examines the structure and issues of the major Healthcare delivery systems including operation, marketing, financial management and sustainability of outpatient clinics, physician's offices, hospitals, long-term care facilities, self-help organizations, patient advocacy groups, accrediting agencies, and the insurance industry. Concepts addressed include demand (what physicians, patients and families want), supply, distribution, utilization of resources, market theories, and cost-benefit analysis, as they apply to healthcare as a service industry and including current and future payment systems for healthcare. Prerequisites: All LDR Core (5000-level) courses OR admission to non-degree graduate certificate program

Prerequisite: All LDR Core (5000-level) courses OR admission to non-degree graduate certificate program.

**HC 6863 - Healthcare Leadership Capstone (3)**

This capstone course will provide students the opportunity to integrate and synthesize previous coursework in leadership with healthcare content through the creation and implementation of applied programming or secondary/archival research. Prerequisites: All LDR Core (5000-level) Courses and LDR 6803, LDR 6823, LDR 6833, LDR 6843. Students must complete this course last in the MSOL Program.

Prerequisite: All LDR Core (5000-level) Courses and LDR 6803, LDR 6823, LDR 6833, LDR 6843. Students must complete this course last in the MSOL Program.

# HCI - Healthcare Informatics

**HCI 5003 - Intro to Health Informatics (3)**

This course examines the principles of health informatics. Students will analyze health informatics processes including the storage, retrieval, acquisition, and utilization of healthcare information with an aim to improve care quality, reduce errors, and engage patients in their care processes. This course provides students with fundamental ideas, concepts, and technology and information systems to aid in providing care. This course will demonstrate the role of informatics and utility in healthcare delivery, incorporating practical examples of operational systems currently in the field of informatics. Topics covered in this course include primary principles governing clinical decision, information retrieval, telemedicine, evidence-based medicine, and bioinformatics.

Prerequisite: None. Corequisite: None. Crosslisted as: None.

**HCI 5013 - Health Research and Analytics (3)**

This course provides an overview of foundational concepts and ideas around utilizing and analyzing healthcare data. The principles of data science and its practical application to diverse areas of health informatics will also be covered in this course. Students will learn the approaches, methods, tools, and concepts of health services research, analysis, presentation, and interpretation of findings. Additionally, this course will include the role of research in public health informatics and its impact on population health and care processes. Students will also work on publicly available data to apply the concepts from this course.

Prerequisite: None. Corequisite: None. Crosslisted as: None.

**HCI 5023 - Interoperability Healthcare & Data (3)**

This course provides an overview of foundational concepts and ideas related to healthcare interoperability. It also covers foundational aspects of healthcare data standardization and its relationship to data architecture, meaningful use, electronic health records (EHR), security, privacy, and most common clinical vocabularies. Students will learn about the dynamics associated with national health standards and the Office of the National Health Coordinator for Health Information Technology (ONC) in supporting standardization and interoperability in the United States. Students will learn the approaches, methods, tools, and concepts utilized in care processes, research, quality improvement, and adoption of evidenced processes in ensuring interoperability in health services research, analysis, presentation, and interpretation of findings.

Prerequisite: None. Corequisite: None. Crosslisted as: None.

# HED-Higher Education Leadership

**HED 6513 - Students & Stakeholders in Higher Education Capstone (3)**

This course introduces students to the major human development theories involving college students in American higher education. Special attention will be given to contemporary student development theory and research. Focus will also be directed toward understanding how this body of theory and research can be used to guide the design of policies and practices in higher education. Prerequisites: All LDR Core (5000-level) courses OR admission to non-degree graduate certificate program

Prerequisite: All LDR Core (5000-level) courses OR admission to non-degree graduate certificate program.

**HED 6533 - Teaching & Learning Higher Education (3)**

This course provides an overview of the issues, principles, and practices associated with effective college teaching. The course assumes, identifies, and uses a body of scholarly knowledge and research appropriate for study and application to the profession of college/university teaching. Topics examined include learning and diversity, teaching models and strategies, teacher and student behaviors and learning outcomes, and instructional improvement strategies. The interaction of theory and practice is an important theme (and challenge) of the course. Prerequisites: All LDR Core (5000-level) courses OR admission to non-degree graduate certificate program

Prerequisite: All LDR Core (5000-level) courses OR admission to non-degree graduate certificate program.

**HED 6553 - Principles & Practices of Academic Advising (3)**

This course examines the foundations of academic advising as essential components of student success and retention in higher education. Topics include developmental advising; research on academic advising; models and delivery systems; advising skills; including diverse populations; influences on the helping process such as personal characteristics, verbal and nonverbal responses and behaviors, and ethical considerations; and evaluation, assessment, and reward systems for advisors and advising programs. Prerequisites: All LDR Core (5000-level) courses OR admission to non-degree graduate certificate program

Prerequisite: All LDR Core (5000-level) courses OR admission to non-degree graduate certificate program.

**HED 6573 - Instructional Leadership in Higher Education Capstone (3)**

This course is the capstone course for all students in the Instructional Leadership Concentration, Higher Education Track. The capstone is a special project conducted within an existing educational setting. It may be arranged within the organization in which the student is employed or in another organization which agrees to work with the student on a project of mutual interest. The capstone experience affords each student an opportunity to apply the skills, knowledge, and abilities gained through the leadership core and concentration-area content courses in a process that will generate a solution(s) to or facilitate substantive consideration of a current educational need or issue. Prerequisites: All LDR Core (5000-level) Courses and LDR 6513, LDR 6533, LDR 6553, LDR 6583. Students must complete this course last in the MSOL Program

Prerequisite: All LDR Core (5000-level) Courses and LDR 6513, LDR 6533, LDR 6553, LDR 6583. Students must complete this course last in the MSOL Program.

# HIS-History

**HIS 103 - American History I (3)**

Traces the major trends in the history of the United States from colonial times to the end of Reconstruction. Concentrates upon the diplomatic, political, economic, intellectual, and cultural achievements of the American nation, set within the larger framework of the European world.

**HIS 113 - American History II (3)**

Increasing emphasis on the post-Civil War industrial development of the United States and its subsequent role as a great world power to present.

**HIS 203 - World Civilization I (3)**

A historical review of human civilization from prehistoric times through the Renaissance. The class focuses upon the political, economic, and cultural achievements of various civilizations of the world.

**HIS 213 - World Civilization II (3)**

A survey of major civilizations of the world in the post-Renaissance period, including Asian, African, and Western European civilizations in the areas of politics, economics, and scientific, and cultural developments. Emphasis is placed on the increasing interdependence of world civilizations and people.

**HIS 251 - Ancient Greece from the Persian Through Peloponnesian Wars (1)**

An examination of the culture of Athens and Sparta during the 5th century B.C., concentrating on the Persian and Peloponnesian wars and their lasting effects on Western Civilization. (Same as PHL 251)

Crosslisted as: PHL 251.

**HIS 253 - The Japanese People (3)**

A humanistic approach to the study of the Japanese people. An emphasis on using a historical context to reveal domestic political, social, and economic associations, as well as important achievements in literature, religion, philosophy and art.

**HIS 263 - Indiana History (3)**

History of Indiana with an emphasis on Indiana's growth and development and its place within U.S. history.

**HIS 273 - Topics in History (3)**

In depth survey of a selected topic in history. The course changes each semester with the specific topic of study announced in the class schedule.

**HIS 323 - The Contemporary World (3)**

An analysis of current global issues from a historical perspective with an emphasis on developing an awareness of cultural diversity and an understanding of the role of international governmental and nongovernmental organizations. (Same as POLS 323) Prerequisite: POLS 113 or HIS 113

Prerequisite: POLS 113 or HIS 113. Crosslisted as: POLS 323.

**HIS 343 - American Political Thought (3)**

A survey and analysis of significant political ideas from colonial times to the present. Some of the ideas discussed in the survey include the philosophies of liberalism, conservatism, and pragmatism, as well as the political thinking of such men as Alexander Hamilton, Thomas Jefferson, John C. Calhoun, Henry Thoreau, Herbert Spencer, and Lester Ward. (Same as POLS 343) Prerequisite: POLS 113

Prerequisite: POLS 113. Crosslisted as: POLS 343.

**HIS 353 - The Civil War & Reconstruction (3)**

A historical review of the American Civil War and Reconstruction. The class focuses on the political, economic, cultural ramifications within American History. Prerequisites: HIS 103, HIS 113, or POLS 113

Prerequisite: HIS 103, HIS 113, or POLS 113 .

**HIS 363 - United States Foreign Policy (3)**

A history of the United States involvement in world affairs from the War of Independence to the present, the close relationship between the foreign policy and domestic concerns is emphasized; an analysis of the policymaking bureaucracy. (Same as POLS 363) Prerequisites: HIS 113

Prerequisite: HIS 113. Crosslisted as: POLS 363.

**HIS 403 - American Constitutional Development (3)**

A study of the historical and judicial developments of the Constitution of the United States by analyzing court decisions and the philosophies of the justices of the Supreme Court. Emphasis on the court's role in the development of national economic policy, with a focus on the court's position on civil rights and liberties, political freedom, and social equality. (Same as POLS 403) Prerequisites: POLS 113

Prerequisite: POLS 113. Crosslisted as: POLS 403.

**HIS 423 - The United States as a World Power (3)**

A study of social, economic, intellectual, and political developments within the United States from approximately 1939 to the present. Emphasis is placed on relating America's developments to its role in international affairs. (Same as POLS 423) Prerequisite: HIS 113

Prerequisite: HIS 113. Crosslisted as: POLS 423.

**HIS 433 - The American Revolution (3)**

A history of the War of Independence and the formation of national government to 1787. Prerequisite: HIS 103

Prerequisite: HIS 103.

**HIS 443 - Readings in American History (3)**

An independent study and research on selected topics in American History. Open to students with departmental approval. Prerequisite: Junior standing or permission of instructor

Prerequisite: Junior standing or permission of instructor.

**HIS 453 - Readings In World History (3)**

An independent study and research on selected topics in World History. Open to students with departmental approval. Prerequisite: Junior standing or permission of instructor

Prerequisite: Junior standing or permission of instructor.

**HIS 4001 - Independent Studies in History (1)**

Credit earned through directed reading, independent study, research, or supervised field work. Maximum 4 hours credit. Prerequisite: Permission of Department Chair

Prerequisite: Permission of Department Chair.

**HIS 4002 - Independent Studies in History (2)**

Credit earned through directed reading, independent study, research, or supervised field work. Maximum 4 hours credit. Prerequisite: Permission of Department Chair

Prerequisite: Permission of Department Chair.

**HIS 4003 - Independent Studies in History (3)**

Credit earned through directed reading, independent study, research, or supervised field work. Maximum 4 hours credit. Prerequisite: Permission of Department Chair

Prerequisite: Permission of Department Chair.

**HIS 4004 - Independent Studies in History (4)**

Credit earned through directed reading, independent study, research, or supervised field work. Maximum 4 hours credit. Prerequisite: Permission of Department Chair

Prerequisite: Permission of Department Chair.

# HNR-Honors Seminar

**HNR 121 - Introduction to Honors Seminar (1)**

An introduction to the Honors Program. Current topics will be discussed in an informal atmosphere. Emphasis will be placed

on thinking critically as well as the ability to convey one's opinions through written essays. Prerequisite: Admission into the Honors Program

Prerequisite: Admission into the Honors Program.

**HNR 200 - Honors Second Year Seminar (no credit) (0)**

A continuation of the honors program core courses introducing students to different ideas and viewpoints through presentations and discussions with guest speakers. This course is graded on a pass/fail basis. Prerequisite: HNR 121 or Permission of the Honors Program Director

Prerequisite: HNR 121 or Permission of the Honors Program Director.

**HNR 201 - Honors Second Year Seminar (1)**

A continuation of the honors program core courses introducing students to different ideas and viewpoints through presentations and discussions with guest speakers. This course is graded on a pass/fail basis. Prerequisite: HNR 121 or Permission of the Honors Program Director

Prerequisite: HNR 121 or Permission of the Honors Program Director.

**HNR 211 - Honors Humanities Seminar (1)**

An honors seminar on special topics in the humanities. May be retaken for credit as long as the topics differ.

**HNR 212 - Honors Humanities Seminar (2)**

An honors seminar on special topics in the humanities. May be retaken for credit as long as the topics differ.

**HNR 221 - Honors Social Science Seminar (1)**

An honors seminar on special topics in the social sciences. May be retaken for credit as long as the topics differ.

**HNR 222 - Honors Social Science Seminar (2)**

An honors seminar on special topics in the social sciences. May be retaken for credit as long as the topics differ.

**HNR 223 - Honors Social Science Seminar (3)**

An honors seminar on special topics in the social sciences. May be retaken for credit as long as the topics differ.

**HNR 300 - Honors Enrichment Trip (no credit) (0)**

A study of a nearby city in detail through a closer look at its history, neighborhoods, politics, and culture. Exploration of the city will be used to further investigate the details they learned in the classroom. This course is graded on a pass/fail basis. Prerequisite: HNR 200/201 or Permission of the Honors Program Director

Prerequisite: HNR 200/201 or Permission of the Honors Program Director.

**HNR 301 - Honors Enrichment Trip (1)**

A study of a nearby city in detail through a closer look at its history, neighborhoods, politics, and culture. Exploration of the city will be used to further investigate the details they learned in the classroom. This course is graded on a pass/fail basis. Prerequisite: HNR 200/201 or Permission of the Honors Program Director

Prerequisite: HNR 200/201 or Permission of the Honors Program Director.

**HNR 311 - Honors Humanities Seminar (1)**

An honors seminar on special topics in the humanities. May be retaken for credit as long as the topics differ.

**HNR 312 - Honors Humanities Seminar (2)**

An honors seminar on special topics in the humanities. May be retaken for credit as long as the topics differ.

**HNR 313 - Honors Humanities Seminar (3)**

An honors seminar on special topics in the humanities. May be retaken for credit as long as the topics differ.

**HNR 322 - Honors Social Science Seminar (2)**

An honors seminar on special topics in the social sciences. May be retaken for credit as long as the topics differ.

**HNR 323 - Honors Social Science Seminar (3)**

An honors seminar on special topics in the social sciences. May be retaken for credit as long as the topics differ.

**HNR 401 - Honors Seminar (1)**

An honors seminar on special topics not considered to be either a humanity or a social science. May be retaken for credit as long as the topics differ.

**HNR 411 - Honors Humanities Seminar (1)**

An honors seminar on special topics in the humanities. May be retaken for credit as long as the topics differ.

**HNR 413 - Honors Humanities Seminar (3)**

An honors seminar on special topics in the humanities. May be retaken for credit as long as the topics differ.

**HNR 421 - Honors Social Science Seminar (1)**

An honors seminar on special topics in the social sciences. May be retaken for credit as long as the topics differ.

**HNR 431 - Honors Mathematics & Science Seminar (1)**

An honors seminar on special topics in the mathematics or sciences. May be retaken for credit as long as the topics differ.

**HNR 432 - Honors Mathematics & Science Seminar (2)**

An honors seminar on special topics in mathematics or science. May be retaken for credit as long as the topics differ.

**HNR 433 - Honors Mathematics & Science Seminar (3)**

An honors seminar on special topics in the mathematics or sciences. May be retaken for credit as long as the topics differ.

**HNR 442 - Honors Seminar (2)**

An honors seminar on special topics not considered to be either a humanity or a social science. May be retaken for credit as long as the topics differ.

# HOS-Hospitality

**HOS 103 - Current Trends in Tourism (3)**

The objective of this class is to look at the research, stats, and current trends as they relate to the Tourism Industry. Upon examination of the research, the class will discuss how the industry continues to adapt to meet the ever changing demands of the public.

**HOS 203 - Lodging Management (3)**

The objectives of this class are to examine the policies, techniques and trends in hotel administration from a front office perspective. Topics such as organization, ethics, procedures, and communication amongst the hotel staff and with the hotel guest will be examined. Prerequisite: Hospitality and Tourism Management Majors Only

Prerequisite: Hospitality and Tourism Management Majors Only.

**HOS 213 - Sophomore Internship in Hospitality Management (3)**

This sophomore experience is the first of two internships required for a Hospitality Management major. This field related experience is under the direction of a field supervisor and University supervisor. The Internship must have the approval of the Department Chair.

Prerequisite: The Internship must have the approval of the Department Chair.

**HOS 303 - Hospitality & Tourism Marketing (3)**

The objective of this class is to provide the student with an understanding of the techniques used to market the many facets of the hospitality and tourism industry. Packaging pricing, promoting, advertising and merchandising will all be explored as they relate to restaurant sales, hotel occupancy, and the travel and tourism industry. Prerequisite: MK 203

Prerequisite: MK 203.

**HOS 313 - Catering (3)**

The objective of this class is look at catering from a business perspective including pricing, production, promoting, packaging, and customer service. Prerequisite: HOS 103

Prerequisite: HOS 103.

**HOS 322 - Meeting & Event Planning (2)**

This class looks at meeting and event planning from an organizational and administration perspective. Customer service as it relates to meeting the needs of the client will be examined. The culminating projects of this class are the creation of an event planning resource notebook and the class project of putting on a "campus event".

**HOS 402 - Beverage Management (2)**

The objective of this class is to give the student an education in the purchasing, storing, serving, and production of alcoholic and non-alcoholic beverages. Prerequisites: 21 years of age

Prerequisite: 21 years of age.

**HOS 404 - Quality Food Preparation (4)**

The class will examine food preparation methods and service techniques important to the success of a food service operation. Menu planning, food preparation and production along with proper food service methods will be studied. A basic knowledge of food service operations will be taught in a lab setting through the production of an "A Night out on the Town". Student will exhibit their skills by performing a variety of tasks in a cooperative environment as they produce a dining experience to the general public. Prerequisite: Hospitality and Tourism Management Majors Only

Prerequisite: Hospitality and Tourism Management Majors Only. Corequisite: Lab Required.

**HOS 413 - Casino, Spa & Resort Management (3)**

This class examines the day to day operations of casinos, spas, and resorts from a front office perspective including the law, procedures, and organizational structure. This class incorporates both classroom and field experiences to give the student the necessary perspective of how these facilities become successful. Prerequisite: BA 123

Prerequisite: BA 123.

**HOS 423 - Sanitation & Health in the Food Service , Lodging & Tourism Industry (3)**

This class will discuss food safety and other health related issues common to the Hospitality Industry, and other institutional programs like hospitals, schools, restaurants, cruise ships, airlines, and other form of travel. Students must pass a National

Sanitation Certification examination upon completion of the course. Prerequisite: Hospitality and Tourism Management Majors Only

Prerequisite: Hospitality and Tourism Management Majors Only.

# HPE-Health Physical Education

**HPE 202 - Introduction to Adaptive Physical Education (2)**

Classroom discussion and supervised lab experience that familiarizes students with a general knowledge of various disability groups and the physical education needs of these special students.

**HPE 221 - Officiating (1)**

Knowledge of the rules and officiating practices of sports.

**HPE 273 - Nutrition (3)**

A review of the nature of nutritional needs. Focus will include the function of nutrients in the body, weight control and the importance of balanced diets.

**HPE 352 - Family Life Education (2)**

Investigation of the biological, psychological and sociological components of sexuality and family life. Issues discussed include the anatomy and physiology of the reproductive systems, gender roles, family living, marriage, parenthood, divorce, and abuse/violence. Prerequisite: Junior standing or permission of instructor

Prerequisite: Junior standing or permission of instructor.

# HR-Human Resources

**HR 303 - Compensation & Benefits (3)**

This course examines the role of compensation and benefits in today's workplace. It emphasizes the role, importance, and impact of a defined compensation and benefits strategy. Emphasis will be on assessment of compensation and benefit plans. Topics include traditional and non-traditional bases of pay, strategies for developing benefits plans, administering compensation, and benefit plans.

**HR 323 - Safety & Health Management (3)**

This course examines the role of occupational safety and health in the workplace today. It emphasizes the need for and the impact of having a strong safety and health program. Topics include identification and assessment of major types of occupational hazards including falls, mechanical, environmental, electrical, fire, weather, and stress. OSHA regulations, fines and authority, safety standards, accident prevention and investigation, safety and analysis, and safety and health management concepts are also covered.

**HR 343 - Healthcare Human Resource Management (3)**

This course provides learners with the tools needed to work with diverse populations, personalities, and positions of individuals in the healthcare sector. Learners will analyze the full continuum of human resource management including effective workforce planning throughout this course.

**HR 403 - Project Management (3)**

A study of effective project planning and management. Topics covered include project goals, objectives, and feasibility. Estimation of completion times and costs, evaluation and review, incentives, and quantitative analysis are also topics. Case studies and project management software used extensively. (Same as MGT 383) Prerequisite: HR 323

Prerequisite: HR 323. Crosslisted as: MGT 383.

**HR 5923 - Strategic Human Resources Management (3)**

This course is designed to provide students with a theoretical framework of strategic human resource management as it applies to organizational effectiveness. The focus of this course is strategic human resource management and the process of linking the human resource function with the strategic objectives of the organization to improve performance. This course focuses on processes and conceptual issues related to recruitment, selection, and retention. Topics include policies, ethical and legal compliance as well as practices related to attraction, development, training, diversity, and performance management.

Prerequisite: None.

**HR 5943 - Certified Professional Human Resources Preparation (3)**

This course is intended to provide a preparation of the Professional Human Resource Certification. It will provide students with knowledge areas of management, laws governing the employment relationship, health and safety. The goals of the course are twofold: first, to familiarize students with the many issues and problems confronting employees, employers, supervisors, and human resources professionals; second, to prepare students for the certification offered through the Society for Human Resource Management. Prerequisites: All LDR Core (5000-level) courses OR admission to non-degree graduate certificate program

Prerequisite: All LDR Core (5000-level) courses OR admission to non-degree graduate certificate program.

**HR 5953 - Compensation & Benefits Management (3)**

This course is designed to enhance the student's knowledge of an advanced comprehensive compensation system that would explore both direct and indirect compensation strategic design, development, implementation, administration, and evaluation. This will also include the effects of compensation system design on other HR functional areas, including but not limited to internal and external equity, pay for performance, and benefit administration. Prerequisites: All LDR Core (5000-level) courses OR admission to non-degree graduate certificate program

Prerequisite: All LDR Core (5000-level) courses OR admission to non-degree graduate certificate program.

**HR 5963 - Human Resource Management Capstone (3)**

This course is designed to provide a capstone or conclusion to the Human Resource Management Concentration. Its objective is to provide an opportunity to conduct independent research on a Human Resource Management theme, analyzing a contemporary HR issue. The topic will be selected by the students, so that they can integrate the linkages between the themes, areas, and disciplinary foci of study, and apply the analytical frameworks, professional writing, research, and leadership skills acquired during the program. Prerequisites: All LDR Core (5000-level) Courses and LDR 5923, LDR 5933, LDR 5943 and LDR 5953. Students must complete this course last in the MSOL Program.

Prerequisite: All LDR Core (5000-level) Courses and LDR 5923, LDR 5933, LDR 5943 and LDR 5953. Students must complete this course last in the MSOL Program.

# HS-Health Science

**HS 104 - Anatomy & Physiology I for Applied Science Majors (4)**

This course is designed to prepare students for a career in health sciences. In this first of a two-course series, students develop an understanding of the close inter-relationship between anatomy, physiology, and pathology as seen in the human organism. It introduces students to the cell, which is the basic structural and functional unit of all organisms and covers tissues, integument, skeleton, muscular, and nervous systems as an integrated unit. Prerequisite: Applied Science Major

Prerequisite: Applied Science Major.

**HS 114 - Anatomy & Physiology II for Applied Science Majors (4)**

This course is designed to prepare students for a career in health sciences. In this second of a two-course series, students develop an understanding of the close inter-relationship between anatomy, physiology, and pathology as seen in the human

organism. This course examines endocrine, cardiovascular, respiratory, lymphatic and immune, gastrointestinal, urinary, and reproductive systems. Prerequisite: Applied Science Major

Prerequisite: Applied Science Major.

# HUM-Humanities

**HUM 173 - Visual Storytelling (3)**

Introduces students to the fundamentals of image-based storytelling using photographs, illustrations, graphics, and video. Lectures, readings, and historical case studies explore approaches to conceiving and crafting visual narratives. Students produce visual stories using their phones or personal cameras and free web-based editing and design software.

Prerequisite: None. Corequisite: None. Crosslisted as: None.

**HUM 203 - Humanities Seminar (3)**

Variable topic humanities-based course focused on both academic and nonacademic discourses, narrative, research and argumentation. This class is writing intensive (which means each student will produce approximately 25 pages of prose). **This course must be completed at Trine University, no transfers or course substitutions.** Prerequisites: ENG 133 or ENG 143 or ENG 153

Prerequisite: ENG 133 or ENG 143 or ENG 153.

**HUM 231 - Special Topics Language & Humanities (1)**

Studies of one of the major topics in the Humanities, focusing on carefully chosen modes of expression that shape our culture. Topic will be announced in the class schedule. This course will change every time it is offered and may therefore be repeated for credit.

**HUM 232 - Special Topics Language & Humanities (2)**

Studies of one of the major topics in the Humanities, focusing on carefully chosen modes of expression that shape our culture. Topic will be announced in the class schedule. This course will change every time it is offered and may therefore be repeated for credit.

**HUM 233 - Special Topics Language & Humanities (3)**

Studies of one of the major topics in the Humanities, focusing on carefully chosen modes of expression that shape our culture. Topic will be announced in the class schedule. This course will change every time it is offered and may therefore be repeated for credit.

**HUM 3001 - Independent Study in Humanities (1)**

Course content in a humanities discipline to be arranged for the individual student according to his/her interest and aptitudes. The number of credit hours will determine the scope of the content. Prerequisite: Permission from the Department Chair

Prerequisite: Permission from the Department Chair.

**HUM 3002 - Independent Study in Humanities (2)**

Course content in a humanities discipline to be arranged for the individual student according to his/her interest and aptitudes. The number of credit hours will determine the scope of the content. Prerequisite: Permission from the Department Chair

Prerequisite: Permission from the Department Chair.

**HUM 3003 - Independent Study in Humanities (3)**

Course content in a humanities discipline to be arranged for the individual student according to his/her interest and aptitudes. The number of credit hours will determine the scope of the content. Prerequisite: Permission from the Department Chair

Prerequisite: Permission from the Department Chair.

# IET-Industrial Engineering Technology

**IET 123 - Materials & Industrial Processes (3)**

An introduction to industrial materials and related processes utilized in mass-production operations. Includes material-focused topics in modern mass production or “flow shop” processes as well as their influence on material selection and the design and development of products. Material selection, lifecycle processing and associated effects on cost, product safety, function, human factors, form, finishes and joining methods are covered.

Prerequisite: none.

**IET 233 - Innovations in Industrial Automation (3)**

Henry Ford’s moving assembly line is used as the basis for understanding legacy manufacturing processes. More recent innovations in modern manufacturing plants will also be explored. Students will be introduced to the philosophy, technology, terminology and practices of modern automation systems across multiple applications. Prerequisite: IET 123

Prerequisite: IET 123.

**IET 253 - Quality Inspection Techniques & Tools (3)**

Foundational quality inspection techniques and tools are covered to prepare students for work in industrial, manufacturing, and research and development environments. Students will gain an understanding of the terminology, tools, and processes used to prevent defective units from reaching the customer. Students will also learn the basics of metrology, quality tools, and continuous improvement methodologies. Prerequisites: MA 123 and IET 123

Prerequisite: MA 123 and IET 123 . Corequisite: none.

**IET 313 - Industrial Manufacturing & Assembly (3)**

This course introduces students to modern manufacturing and assembly terminology, concepts and processes. Course concepts will focus on the Design for Manufacturing and Assembly (DFMA) methodology. Prerequisite: IET 123

Prerequisite: IET 123. Corequisite: none.

**IET 403 - Quality Assurance (3)**

This course uses the latest ISO 9001 quality management principles as the foundation of quality assurance. Basic quality and statistical tools are reviewed to develop metrology and calibration plans, leading to the execution of quality audits and implementing corrective actions. Prerequisite: IET 123

Prerequisite: IET 123. Corequisite: none.

**IET 413 - Senior Capstone Proposal (3)**

A survey of organizational effectiveness and leadership topics will be covered in the industrial sector. Students will develop a SMART (specific, measurable, achievable, realistic, and timely) project charter aimed at improving an industrial operation and or organization in the final capstone course. To be taken during the final semester of the IET program.

Prerequisite: Final semester of IET program. Corequisite: none.

**IET 423 - Senior Capstone Project (3)**

This course is designed to reinforce learning objectives found throughout the Industrial Engineering Technology program. Students will apply IET concepts to a real-world project which will be presented at the conclusion of the course.
Prerequisite: IET 413

Prerequisite: IET 413. Corequisite: none.

# INF-Informatics

**INF 132 - Integrated Development (Visual Basics) (2)**

User interface design fundamentals using VBasic, control objects, event-driven Windows applications, forms, functions, arrays, parameter passing, graphical user interface, using components of an integrated development environment. Prerequisite: MA 113 or equivalent.

Prerequisite: MA 113 or equivalent.

**INF 143 - Introduction to C# (3)**

An introductory course in the fundamentals of C# including user interface design, control objects, event-driven applications, forms, functions, arrays, parameter passing, and using the components of an integrated development environment. Prerequisite: MA 113 or equivalent

Prerequisite: MA 113 or equivalent.

**INF 153 - Introduction to Python (3)**

This course introduces computer programming using the Python programming language. Emphasis is placed on procedural programming, algorithm, design, and language constructs common to most high level languages. An introduction to Python classes and object oriented design is included. Prerequisite: MA 113 or equivalent

Prerequisite: MA 113 or equivalent.

**INF 163 - Structured Logic & Design (C Programming) (3)**

Algorithmic problem solving and programming using top-down design, stepwise refinement and functional decomposition. Declarations, operations, assignment conditional and loop statements, parameter passing, arrays, and structures. Prerequisites: MA 113 or equivalent

Prerequisite: MA 113 or equivalent.

**INF 183 - Introduction to LINUX (3)**

This course is intended to introduce students to the Linux operating system with emphasis on systems installation, configurations, customization, and maintenance of Linux-based systems. Prerequisite: CSIT 103

Prerequisite: CSIT 103.

**INF 213 - Digital Forensic Science I (3)**

This course introduces the student to investigative techniques involving computers and other electronic devices. Topics include investigative procedures, computer hardware, data recovery methods, and laws concerning digital devices. This course also covers how computers are used in investigations. Prerequisite: ENG 133, CSIT 103, INF 183

Prerequisite: ENG 133, CSIT 103, INF 183 .

**INF 263 - Data Management (3)**

Students will apply the concepts, techniques, and tools necessary to develop relational database systems and applications. Topics covered in this course include logical design of relational database models, entity relationship diagramming and normalization, and database management system architectures. Additional concepts include file system management, structured query language, and data integrity, security, and constraints.

Prerequisite: none.

**INF 313 - Digital Forensic Science II (3)**

This course continues the Digital Forensics 1 course by advancing into more detailed analysis techniques as expected by law enforcement and the court system. Topics include evidence collection procedures, detailed hardware analysis and report preparation. Prerequisite: INF 213

Prerequisite: INF 213.

**INF 343 - Information Security (3)**

Principles of information security, including concepts and theory of security policies, access control methods, site security, information security, system security, user security, application security, and managing security functions through cryptographic services, protocols, authentication, authorization, and access control technologies.

**INF 373 - Computer Architecture (3)**

This course focuses on the organization and architecture of computer systems hardware; memory systems; storage devices; input/output devices; instruction set architectures; addressing modes; processor design and computer arithmetic. Students present PC-related topics. Prerequisite: CSIT 103

Prerequisite: CSIT 103.

**INF 383 - Principles of Health Informatics (3)**

This course offers an overview of the field of health informatics by providing students with fundamental knowledge of the concepts of health informatics and how technology can be used in the delivery of health care. Prerequisite: CSIT 253

Prerequisite: CSIT 253.

**INF 393 - Data Visualization (3)**

Introduction to data visualization including both the principles and techniques. Students will learn the value of visualization, specific techniques in information visualization and scientific visualization, and understand how to best leverage visualization methods. Prerequisite: INF 263

Prerequisite: INF 263.

**INF 3111 - Informatics Internship (1)**

This course involves meaningful work experience related to the student's field of study or other functional areas of Informatics at an approved company. The assignment must be approved by both the student's advisor and the Department Chair. A maximum of three (3) credit hours may be granted in a given semester. Prerequisite: Informatics major, 3.0 GPA, Junior/Senior standing, and permission of advisor and the Department Chair.

Prerequisite: Informatics major, 3.0 GPA, Junior/Senior standing, and permission of advisor and the Department Chair. .

**INF 3112 - Informatics Internship (2)**

This course involves meaningful work experience related to the student's field of study or other functional areas of Informatics at an approved company. The assignment must be approved by both the student's advisor and the Department Chair. A maximum of three (3) credit hours may be granted in a given semester. Prerequisite: Informatics major, 3.0 GPA, Junior/Senior standing, and permission of advisor and the Department Chair.

Prerequisite: Informatics major, 3.0 GPA, Junior/Senior standing, and permission of advisor and the Department Chair. .

**INF 3113 - Informatics Internship (3)**

This course involves meaningful work experience related to the student's field of study or other functional areas of Informatics at an approved company. The assignment must be approved by both the student's advisor and the Department Chair. A maximum of three (3) credit hours may be granted in a given semester. Prerequisite: Informatics major, 3.0 GPA, Junior/Senior

standing, and permission of advisor and the Department Chair.

Prerequisite: Informatics major, 3.0 GPA, Junior/Senior standing, and permission of advisor and the Department Chair. .

**INF 403 - Advanced Database Management (3)**

This course provides coverage of advanced data management principles with a focus on data structures and query languages. Students will study data models and the foundations of structuring, processing, storing and querying data. Database system architectures and technologies are evaluated for efficiency, flexibility and efficacy. Prerequisite: INF 263

Prerequisite: INF 263.

**INF 413 - Mobile Forensics (3)**

With the unimaginable growth, prevalence, and proliferation of the mobile device industry, more evidence and information important to investigations will be found on them. This course focuses on the collection, preservation, and analysis of digital evidence techniques used by today's mobile forensic examiners as well as on the design of the popular mobile operating systems to defend against common attacks and exploits. Prerequisites: INF 313

Prerequisite: INF 313.

**INF 433 - Data Mining & Visualization (3)**

This course is designed to study the principles and practices of data mining and tasks both descriptive (e.g. exploratory data analysis, classification, association) and prescriptive (e.g. prediction, regression and estimation) to analyze and obtain patterns in large observational data sets. This course will also include the application of diverse visualization practices. Prerequisite: INF 393

Prerequisite: INF 393.

**INF 443 - Advanced Cybersecurity Concepts (3)**

This course provides a monitored structure for application of the skills and knowledge acquired throughout the Cybersecurity program. Emphasis is placed on the use of real-world security problems, issues, and situations. Course assignments will require the use of protection, detection, deterrence, and response techniques in addressing threats, vulnerabilities, and risks found in businesses today. Prerequisites: INF 313, INF 343

Prerequisite: INF 313, INF 343.

**INF 493 - Informatics Capstone (3)**

In this course, Informatics majors apply the techniques they have learned in prior coursework to a significant project of their own definition. The project may be completed through group effort. The design of the course follows the goals for the capstone experience. Students define the information problem for themselves, determine what techniques to use for the information problem they identify, and integrate human-centered and technical dimensions of information systems. Prerequisite: Senior Standing

Prerequisite: Senior Standing.

**INF 4001 - Independent Research in Informatics (1)**

Independent research under the direction of an individual instructor. A research paper or project is required. Prerequisite: Informatics major, 3.0 GPA, Junior/Senior standing, and permission of advisor and the Department Chair.

Prerequisite: Informatics major, 3.0 GPA, Junior/Senior standing, and permission of advisor and the Department Chair. .

**INF 4002 - Independent Research in Informatics (2)**

Independent research under the direction of an individual instructor. A research paper or project is required. Prerequisite: Informatics major, 3.0 GPA, Junior/Senior standing, and permission of advisor and the Department Chair.

Prerequisite: Informatics major, 3.0 GPA, Junior/Senior standing, and permission of advisor and the Department Chair. .

**INF 4003 - Independent Research in Informatics (3)**

Independent research under the direction of an individual instructor. A research paper or project is required. Prerequisite: Informatics major, 3.0 GPA, Junior/Senior standing, and permission of advisor and the Department Chair.

Prerequisite: Informatics major, 3.0 GPA, Junior/Senior standing, and permission of advisor and the Department Chair. .

**INF 4111 - Special Topics in Informatics (1)**

Addresses advanced topics in Informatics that vary by year. Prerequisite: Junior/Senior standing, and permission of advisor and the Department Chair.

Prerequisite: Junior/Senior standing, and permission of advisor and the Department Chair. .

**INF 4112 - Special Topics in Informatics (2)**

Addresses advanced topics in Informatics that vary by year. Prerequisite: Junior/Senior standing, and permission of advisor and the Department Chair.

Prerequisite: Junior/Senior standing, and permission of advisor and the Department Chair. .

**INF 4113 - Special Topics in Informatics (3)**

Addresses advanced topics in Informatics that vary by year. Prerequisite: Junior/Senior standing, and permission of advisor and the Department Chair.

Prerequisite: Junior/Senior standing, and permission of advisor and the Department Chair. .

**INF 503 - Advanced Database (3)**

The course prepares students to manage advanced database applications. Students will explore high-level concepts and strategies for database administration to optimize business practices which include performance management, data integrity and disaster management. Students will conclude the course with a project developing a business database.

Prerequisite: Graduate student enrolled in the Information Systems Programs.

# IS-Information Studies

**IS 373 - System Security (3)**

This course prepares students to implement, monitor and administer IT infrastructure using information security policies and procedures. Topics will cover data confidentiality, integrity and availability. Students will be prepared to take the SSCP exam, a global IT security certification.

Prerequisite: none. Corequisite: none.

**IS 383 - Security Analysis (3)**

Students will learn to leverage intelligence and threat detection techniques, analyze and interpret data, and identify and address vulnerabilities. Students will also recommend preventative measures, and effectively respond to incidents. This course also prepares students to take the CompTIA Cybersecurity Analyst (CySA+) CS0-002 exam.

Prerequisite: none.

**IS 383 - Security Analysis (3)**

Students will learn to leverage intelligence and threat detection techniques, analyze and interpret data, and identify and address vulnerabilities. Students will also recommend preventative measures, and effectively respond to incidents.

Prerequisite: none.

**IS 393 - Security CyberOps (3)**

In this course students will develop skills and knowledge in security concepts, security monitoring, host-based analysis, network intrusion analysis, and security policies and procedures. This will prepare students to take the Cisco CyberOps Associate certification. Students will also work within computer security incident response teams (CSIRTs) and product security incident response teams (PSIRTs.)

Prerequisite: none. Corequisite: none.

**IS 3003 - Ethical Hacker (3)**

This course introduces the student to methods and techniques used by computer hackers and penetration testers. The primary goal of this course is to provide the student with an understanding of offensive security, with an emphasis on practical exposure to hacking, and to defend against cyberattacks. This course equips students to work as computer security professionals by teaching the fundamentals of ethical hacking and also prepares them for the EC-Council Certified Ethical Hacker (CEH) certification exam.

**IS 403 - Cybersecurity (3)**

This course prepares students for the Certified Secure Software Lifecycle Professional (CSSLP) certification. Emphasis is placed on security practices such as authentication, authorization, and auditing into each phase of the software development lifecycle (SDLC). Students will cover a broad range of topics in concert with the CSSLP Common Body of Knowledge (CBK®) to ensure application across all disciplines in the field of information security.

Prerequisite: none. Corequisite: none.

**IS 483 - Information Systems Capstone Proposal (3)**

A Capstone project proposal is determined from a wide range of areas related to technology. Students will create a proposal to solve a problem using an industry standard framework. Final deliverables include a documented project proposal and formal presentation of the proposal.

Prerequisite: Senior Standing.

**IS 493 - Information Systems Capstone Project (3)**

The capstone project uses the proposal from IS 483 to create an executable project plan. Students build a prototype model, software or system application, simulation, or design artifact that fulfills a solution or need. Final deliverables include a documented project plan, completion of the project objectives, and formal presentation of the project. Prerequisite: IS 483

Prerequisite: IS 483 Information Systems Capstone Proposal.

**IS 5103 - Object-Oriented Programming in Java (3)**

Throughout this course, students will explore Object-Oriented programming concepts using the Java programming language. Topics included in this course are collection classes, searching and sorting, threads, GUI, and Java Database Connectivity. Students will develop applications using Java through the use of structured and object-based programming techniques. Java 7 and Eclipse IDE are also used in this course.

Prerequisite: None.

**IS 5113 - Data Mining & Data Visualization (3)**

Throughout this course, students will learn how to conduct data mining processes and techniques to implement data visualization. Students will examine data analytic tools including how to prepare, clean, arrange, and visualize the information for the end users. Students will create visual information using dashboards, software, and code. Additionally, students will evaluate analytic tools to prepare data for import into data visualization tools.

Prerequisite: None.

**IS 5203 - Network Management (3)**

Throughout this course, students will explore the information systems infrastructure. This course will focus on data communications and networks. Students will examine layered network architectures, communication hardware, and protocols associated with networking. Emerging technologies such as mobility, cloud computing, Big Data, tools for data analytics, and artificial intelligence (AI) will also be covered.

Crosslisted as: DIT 7003.

**IS 5213 - Data Science & Big Data (3)**

This course introduces students to Data Science through the use of data analytics tools to transfer large amounts of data into information. Concepts of Big Data are explored along with their impact on decision-making in the business industry. Students work with open source programming language.  Cross listed: DIT 7023

Prerequisite: None. Crosslisted as: DIT 7023.

**IS 5223 - Advanced Cloud Computing & Architecture (3)**

This course equips students with skills to design and manage cloud architectures in an organization. Implementation of multiple cloud platforms and topologies will be covered. Students learn complex hybrid and multi-cloud solutions needed to optimize IT infrastructures.

**IS 5233 - Cloud DevOps & Automation (3)**

This course introduces students to the principles of DevOps and automation in cloud computing. Students will learn the tools and techniques to automate cloud infrastructure and application deployment, including continuous integration and continuous deployment (CI/CD) pipelines, infrastructure as code (IaC), and containerization. Collaboration between development and operations teams to achieve faster, more reliable software delivery is explored.

**IS 5253 - Security Operations & Monitoring (3)**

This course focuses on the principles and practices of security operations and monitoring that protect modern information systems. The course emphasizes real-time monitoring, incident response, and the improvement of security postures using security operations centers (SOCs). Students explore the operational aspects of cybersecurity focusing on technologies, processes, and strategies used to identify security threats.

**IS 5293 - Cloud Security & Governance (3)**

This course focuses on the critical aspects of security, privacy, and governance in the cloud environment.  Students will explore the challenges of cloud security enterprise infrastructure. Strategies and tools to protect data, manage identities, and ensure compliance with regulatory requirements are addressed.

**IS 5303 - Information Systems Development & Design (3)**

This course is a survey and overview of creating software solutions using professional programming practice including a study of systems analysis and design, using selected engineering and management science techniques and practices. Topics include requirements determination, modeling, decision making, and proposal development. The System Development Life Cycle Model, including system implementation and post implementation activities, is examined. Research and project assignments related to information systems analysis design, implementation, and/or project planning and control, require individual and group work. Prerequisite: Graduate standing

Prerequisite: Graduate standing.

**IS 5403 - Cybersecurity (3)**

This course provides knowledge and practical skills required for a variety of cybersecurity roles. Throughout this course, students will use technologies and tools to identify and address security threats, attacks and vulnerabilities. Emphasis is placed on the latest trends and techniques in risk management, risk mitigation, threat management and intrusion detection. This course also covers principles and foundations of network architecture and design, cryptography and PKI. (same as DIT 7013) Prerequisite: IS 5203 or DIT 7003

Prerequisite: IS 5203 or DIT 7003. Crosslisted as: DIT 7013 Cybersecurity.

**IS 5503 - Cloud Computing (3)**

This course examines public and private clouds used in hybrid and multi-cloud topologies, major public cloud providers and their related services. Emphasis is placed on cloud migration strategies, scalable cloud deployments, and management of data in the cloud.

**IS 5803 - Information Studies Capstone (3)**

This course involves a project-based approach to identification, solutioning, and provisioning of an enterprise information or technology problem. The capstone project will utilize systems engineering and design concepts and system development lifecycle models to solve a real-world technological challenge.

Prerequisite: Graduate standing, must take last semester of Information Studies program.

# LAW-Law

**LAW 203 - Business Law & Ethics (3)**

This course is an introduction to the American legal system as it relates to business enterprises and society. It includes a survey of courts, torts, ethics and public policy. It involves a study of the constitution, the common law of contracts, including contract formation, performance, breach and remedies, as well as a study of the law of sales under the Uniform Commercial Code.

Prerequisite: none.

**LAW 303 - Business Law II (3)**

This course is a study of the law of agency, partnerships, corporations, and other business organizations. It includes a study of negotiable instruments, secured transactions, surety ship, bankruptcy, securities regulation, and related legal issues. Prerequisite: LAW 203

Prerequisite: LAW 203.

**LAW 313 - Auction Law (3)**

An overview of laws impacting the auctioneering environment. Ethical standards and legal ramifications of actions within the auctioneering profession will be explored and discussed. Prerequisite: LAW 203

Prerequisite: LAW 203.

**LAW 323 - Bankruptcy (3)**

An in-depth study of federal bankruptcy regulations as well as state and local regulation. The impact of bankruptcy on the auctioneering industry will be examined. Prerequisite: LAW 203

Prerequisite: LAW 203.

**LAW 333 - Legal Professions and Preparation (3)**

Throughout this course, students will examine the role of a lawyer. Students will learn the requirements needed to be admitted

to law school and the skills necessary to be a successful law student. This course will prepare learners to sit for the Law School Admissions Test (LSAT) exam and to apply for law school. Throughout this course students will also examine the various areas of practices and state Bar requirements.

**LAW 403 - Employment Law (3)**

This course is a survey of the law relating to the employment relationship with emphasis on statutory and case law. The course will discuss various Human Resource Functions and will consider the ethical implications to organizations when applying employment laws. Prerequisites: LAW 203, MGT 313, MGT 363

Prerequisite: LAW 203, MGT 313, MGT 363.

**LAW 413 - International Law (3)**

The legal considerations governing international business transactions. Introduction to the international legal environment including the status of international law, international dispute settlement, conflicts of law. A more detailed study of the international contracting process, international payment mechanisms, carriage contracts, insurance issues, and related subjects. Government regulation of international business will also be addressed. Prerequisites: LAW 203, BA 343

Prerequisite: LAW 203, BA 343 .

**LAW 5003 - Law & the Engineering Professional (3)**

This class will help students develop Intellectual Property and Contract acumen. Students will immerse themselves in practical application, critical reading and the interpretation of modern case law. Course will present: legal guidelines involving owners, design professionals, and contractors; sources of law, forms of association, and agency,Â· including formation, contracts, interpretation, performance problems, disputes, and claims; standards of care and the management of construction claims; duties and obligations of the Engineering professional, the owner, and the contractor. Prerequisite: Graduate standing

Prerequisite: Graduate standing.

**LAW 603 - Advanced Employment Law (3)**

An in-depth study of the legal issues that may arise as a result of the employer-employee relationship. Topics include the establishment of employment and its terms, employer's obligation to employees, and termination of the employee relationship. The course examines federal and state statutory and case law on wage and hour issues, safety, and workplace discrimination, among other important topics. Prerequisite: Must be admitted to the MSCJ Program

Prerequisite: Must be admitted to the MSCJ Program.

**LAW 613 - Advanced Criminal Procedure: Investigation Adjudication (3)**

This course covers pretrial law enforcement investigatory practices from investigation to charging, with an emphasis on constitutional law concerns. Additionally it covers the criminal trial process after police investigation ends and the adjudicative process commences. Areas of emphasis include search and seizure, confessions, right to counsel, right against self-incrimination, pretrial issues, the charging process, pretrial release and discovery, the trial, and post-conviction proceedings including sentencing and appeals. The course involves the study of United States Supreme Court cases to identify the current law on the topics studied as well as to identify the overarching themes in the Court's jurisprudence. Prerequisite: Must be admitted to either the MSCJ Program

Prerequisite: Must be admitted to either the MSCJ Program.

**LAW 623 - Children and the Law (3)**

This course examines the issues, policies, and procedures within the criminal justice system as they pertain to children. Topics include the interrelationship between police, probation, juvenile court, and juvenile corrections system, and how these entities work together to achieve juvenile justice and rehabilitation of the child. The course further takes an in-depth look at the rights and protections afforded to minors under common law doctrine, federal constitutional principles, and legislative enactments. Prerequisite: Must be admitted to the MSCJ Program

Prerequisite: Must be admitted to the MSCJ Program.

**LAW 693 - Law Concentration Demonstration Capstone (3)**

An in-depth analysis of the concepts contained within the concentration courses. Conducted under the direction of a criminal justice faculty member, the student will design and implement a capstone project, and then present the results to a committee of at least two full-time or adjunct professors with legal experience. Prerequisite: CRJ 593. Must be taken in the final term of the MSCJ and may be taken with one other MSCJ course

Prerequisite: CRJ 593. Must be taken in the final term of the MSCJ and may be taken with one other MSCJ course.

# LDR-Leadership

**LDR 101 - Leadership Philosophy (1)**

This course introduces the main concepts of organizational leadership. The role of the leader and the skillset needed to be an effective leader within the organization will be explored. The course sets a foundation for future classes in the program.

**LDR 103 - Introduction to Organization Leadership (3)**

This course introduces the principal frameworks in the field of Organizational Leadership and at the same time, develop skills to explore leadership challenges and opportunities. Individual, group and organizational levels of Organizational Leadership will be considered by utilizing the concepts and practices within the field of Organizational Behavior. Prerequisite: LDR 101

Prerequisite: LDR 101.

**LDR 203 - Leadership Strengths & Skills (3)**

Throughout this course, students will use strength-based approaches to develop their leadership skills. Utilizing assessments, students will reflect on their personal leadership strengths and use these to develop problem-solving, goal achievement, effective communication, and team management skills. Additionally, students will identify essential leadership principles and theories needed to lead groups and organizations.

Prerequisite: None. Corequisite: None.

**LDR 303 - Contemporary Leadership Theory & Practice (3)**

This course examines the major theories, principles, and concepts related to the art and practice of leadership. Multiple contexts of leadership will be analyzed, including self-leadership, one-on-one leadership, team leadership and organizational leadership. Readings, case studies, and activities promote the development of a deeper understanding of the historical, political, social, cultural, psychological and organizational contexts in which leadership occurs. Information presented in the course includes methods of social scientific inquiry through which students assess their individual leadership perspectives and competencies and develop a personal leadership philosophy.

**LDR 313 - Topics in Organizational Leadership (3)**

This course will explore a specific topic area within organizational leadership.

Prerequisite: None.

**LDR 323 - Leading Effective Teams (3)**

This course introduces best practices for developing a team, generating trust among team players, and resolving conflicts that may arise. Students will identify strategies to produce manageable team goals and strategic processes. The course will equip students with concepts, frameworks, and critical theories to effectively analyze and build complex work groups with employees from diverse backgrounds, with varying dynamics and strengths, to improve the overall team performance.

**LDR 333 - Organizational Leadership Development & Change (3)**

The course explores approaches to effective leadership within the context of organizational change. A variety of change

opportunities will be identified and explored.

Prerequisite: None.

**LDR 343 - Conflict Resolution (3)**

This course provides learners with the ability to identify common organizational conflicts, understand the stages of conflict resolution, develop negotiation and bargaining strategies, and ultimately create skills for building solutions to conflict and crisis.

Prerequisite: None.

**LDR 403 - Creativity, Innovation, and Influence (3)**

This course empowers leaders to envision and develop new ideas from inception through implementation. Readings and activities engage students in defining and building creativity, critical thinking, and collaboration skills. These skills can be used to facilitate innovation in individuals, groups, organizations, and communities.

**LDR 433 - Leadership Practicum (3)**

This course deepens students' capacity for leadership, in addition to concluding the leadership minor by linking leadership practice to leadership theory. Students assume leadership responsibilities with a Trine University or community organization, program, or project in order to gain direct leadership experience and further the mission and goals of the selected organization. Students will set goals, practice and develop skills, reflect on experiences, evaluate actions, discuss lessons learned, and complete assignments. A well-written synthesis paper and a high-quality portfolio presentation are crafted to integrate students' learning about leadership and to provide a post-graduation plan for life-long leadership development. Current and active involvement in a leadership position is required for students in this class.

**LDR 453 - Leadership Capstone (3)**

The capstone course provides a synthesis of leadership concepts, competencies and processes within an organizational context. Students will apply advanced leadership knowledge, theory and skills to challenging issues, and problems within organizations. Students will exhibit the knowledge and skills that they have learned throughout the BSOL. Prerequisite: Completion of all leadership core courses (Required for all BSOL students, transfer credits not accepted for this course).

Prerequisite: Completion of all leadership core courses (Required for all BSOL students, transfer credits not accepted for this course). .

**LDR 5003 - Leadership Philosophy (3)**

Throughout this course, students will explore the nature of leadership models and theories. Students will examine these models through broad and diverse viewpoints. Additionally, students will analyze these approaches to leadership, giving special attention to how the models can improve leadership in the real-world situations.

**LDR 5013 - Group Dynamics Within Organizations (3)**

This course will equip students to fully understand the complexities of organizational systems and cultures, the ways in which these forces manifest themselves, and how leaders intentionally impact the shape that these forces take within their organizations. Principles and dynamics of group interaction and the application of various organizational systems will be examined. Students will reflect on how group dynamics are formed, their structures and how to manage attitudes and behavioral patterns of a group.

**LDR 5023 - Decision Making for Leaders (3)**

This course examines a leader’s influence on decision making in an organization. Students will analyze negotiations and learn techniques for effective decision making.

**LDR 5032 - Economics & Accounting Practices for Leaders (2)**

This course will equip students to fully understand the complexities of different economic ways of thinking and understanding

diverse economic systems. Explanations of how markets are competitive and how they are regulated will be examined. Accounting practices related to the creation of accounting statements are analyzed and technical skills needed to analyze these financial statements are developed.

**LDR 5043 - Organizational Systems & Cultures (3)**

The complexities of organizational systems and cultures, how these forces manifest themselves, and the way leaders intentionally impact these forces in their organizations will be explored.

**LDR 5053 - Legal Issues in Organizational Leadership (3)**

This course will provide students with information to fully understand the complexities of recognition of legal and ethical issues when making business decisions. Students will gain an enhanced understanding of legal rules and ethical constraints. Introduction of legal systems and legal concepts will be offered.

**LDR 5063 - Organizational Development and Change (3)**

This course prepares students to successfully implement change in organizations. Students will evaluate theories and strategies used to create change in organizations. Students will identify the need for change and recommend a plan for change management. This course will include topics such as the role of leadership, employee acceptance and ethical considerations.

**LDR 5083 - Conflict Resolution for Leaders (3)**

This course will prepare leaders for conflict in an organization. Students will also explore theories, methods, skills, and practices associated with successfully engaging in the dynamics of conflict and negotiation interactions.

**LDR 5113 - Organizational Leadership for Engineers (3)**

This course provides a foundation for engineers and scientists currently in or seeking future leadership roles in technical organizations. Students learn to lead and motivate teams that produce value-added results by managing conflict, building shared visions, and communicating effectively.

**LDR 5203 - Leadership Ethics (3)**

Students learn about the impact ethical leaders have on an organization and its culture. The varied facets of ethics development and ethical decision-making will be explored.

**LDR 5223 - Organizational Communication for Leaders (3)**

This course examines different perspectives of leadership communication through theory and practical approaches. Applied topics such as organizational behavior, conflict, and the impact of technology on organizational communications will be investigated.

**LDR 5253 - Technology Topics for Leaders (3)**

With the vast and varied technologies available to leaders, it is no doubt managing these technologies can be challenging. Yet, leaders must have a sense of which technologies will help the organization and its members to be successful. While an organizational leader does not need to be a technology expert, having an awareness of the impact technology has on an organization is important.

**LDR 5333 - Research Methods (3)**

This course explores quantitative, qualitative, and mixed methods approaches to research. Students will identify, review, and analyze literature relevant to their organizational leadership interests.

**LDR 6563 - Organizational Leadership Capstone (3)**

The capstone focuses on the leadership competencies that the student has gained throughout the MSOL program. There is an emphasis on the ethical dimensions of problem solving in organizational leadership which will prepare graduates to succeed, lead and serve.

# MAE-Mechanical Aero Engineering

**MAE 112 - Introduction to MATLAB and Excel (2)**

An introduction to MATLAB and Excel to solve engineering problems. Prerequisite: MA 113 or higher

Prerequisite: MA 113 or higher.

**MAE 202 - Mechanical Engineering Analysis (2)**

An introduction to analytical and numerical methods of solving mechanical engineering problems. An introduction to various topics of mechanical engineering focusing on the interrelationship between mathematics, natural sciences, and engineering design. Prerequisite: MA 134, Corequisite: EGR 143

Prerequisite: MA 134. Corequisite: EGR 143.

**MAE 241 - Manufacturing Processes & Equipment Laboratory (1)**

Demonstrations of sand molding, metal casting, metal removal processes (turning, milling, drilling, grinding), deformation processing, and welding processes. Prerequisites: ES 233; Corequisite: ES 243, MAE 242

Prerequisite: ES 233. Corequisite: ES 243, MAE 242.

**MAE 242 - Manufacturing Processes & Equipment (2)**

An examination of commonly used engineering materials and the manufacturing processes and machines used in processing these materials. Prerequisites: ES 233; Corequisite: ES 243

Prerequisite: ES 233. Corequisite: ES 243.

**MAE 303 - Mechanics of Machinery (3)**

Topics include: study of the kinematics and dynamics of mechanisms. Fundamentals of displacement, velocity, and acceleration analysis of rigid bodies as a basis for the study of mechanisms. Motion analysis of linkages, cams, and gearing. Static and inertia force in machines. Balancing of rotating and reciprocating masses. Prerequisite: ES 223, MAE 112, MAE 202

Prerequisite: ES 223, MAE 112, MAE 202.

**MAE 323 - Thermodynamics II (3)**

Gas power systems: air-standard cycles, gas turbines. Refrigeration and heat pump systems. Non-reacting ideal gas mixtures and psychometrics. Reacting mixtures and combustion. Compressible flow. Prerequisite: ES 313 and MAE 112

Prerequisite: ES 313 and MAE 112.

**MAE 353 - Machine Component Design (3)**

Topics include: stress analysis of machine parts, combined stresses, working stress, stress concentration, theory of failure for both static and fatigue loadings, design of machine elements. Prerequisites: ES 233, ES 243

Prerequisite: ES 233, ES 243.

**MAE 363 - Introduction to Mechatronics (3)**

A multidisciplinary, hands-on, project-oriented course studying the use of electronics and microprocessors to control mechanical devices. Students complete a design project in mechatronics. Projects may include building an analog to digital converter, using a transistor H-bridge for motor control, construction of digital logic circuits, use of proximity sensors, and creating music using a microprocessor. Prerequisite: ES 253 or ECE 213

Prerequisite: ES 253 or ECE 213.

**MAE 373 - Computer-Aided Machine Design (3)**

Use of computer applications software as a part of the engineering design process. Introduction to the finite element method for stress analysis. Software packages, such as nonlinear solvers, finite element analysis, solid modeling, and kinematic simulation, will be introduced. Design work using these tools will be a major component of the course. Prerequisites: EGR 143 and ES 243

Prerequisite: EGR 143 and ES 243. Corequisite: none.

**MAE 383 - Metallurgical Thermodynamics (3)**

Thermodynamic fundamentals and their application to metallurgical processes such as melting, phase transformations, and melt composition control. First and Second Laws in an open system. Property relationships and Maxwell's relations. Physical and chemical equilibrium. Thermodynamic basis of phase diagrams, and metallurgical solution activities. Introduction to statistical thermodynamics. Applications to melt chemistry control and heat treatment processes. Prerequisites: ES 233 and ES 313

Prerequisite: ES 233 and ES 313.

**MAE 393 - Metallurgical Transport Processes (3)**

Topics include: thermal, fluid, and diffusional transport in metallurgical processes, such as cupola melting, AOD vessel operation, electric, and reverberatory furnace chemistry control, steel making, and recovery of secondary aluminum and copper. Application of mathematical models from fluid mechanics, heat transfer, and mass transport to the fluid, thermal, and diffusional aspects of metallurgical processes. Prerequisite: ES 323 or MAE 3033

Prerequisite: ES 323 or MAE 3033.

**MAE 3033 - Fluid Dynamics for Mechanical Engineers (3)**

Fundamentals of fluid mechanics. Properties, characteristics, parameters, and governing equations of fluid flow in laminar and turbulent regimes. Prerequisites: ES 223, ES 313, MA 233, MAE 112 and MAE 202

Prerequisite: ES 223, ES 313, MA 233, MAE 112 and MAE 202.

**MAE 413 - Thermo-Fluid Component Design (3)**

Introduction to components for energy transfer including ducts, valves, pumps, fans, compressors, heat exchangers, and burners. Design of piping systems and fluid networks. Analysis of pumps and design of systems including pumps. Design of duct systems. Analysis of fans, blowers, compressors, and design of systems which use them. Prerequisites: ES 343, MAE 3033

Prerequisite: ES 343, MAE 3033.

**MAE 443 - Engineering Metallurgy (3)**

Physical metallurgy of practical engineering alloys as it relates to processing and mechanical properties. Ferrous alloys and selected non-ferrous alloys are covered. Property measurements and other characterization techniques and their meanings. Phase diagrams, heat treatment and structure-property processing relationships in practical steels, cast irons, and aluminum alloys. Laboratory measurement of properties and microstructure: tensile strength, optical metallography, impact toughness, statistical nature of strength, plastic strain anisotropy in sheet metal. Prerequisite: ES 233

Prerequisite: ES 233.

**MAE 453 - Mechanical Vibration (3)**

Introduction to vibration theory and analysis. Undamped, damped, free and forced vibration of single degree-of-freedom mechanical systems. Transient vibration and response to nonperiodic excitation. Vibration of two degree-of-freedom systems without damping. Vibration isolation and vibration absorbers. Prerequisites: MA 233, MAE 303

Prerequisite: MA 233, MAE 303.

**MAE 463 - Mechanical Measure Laboratory (3)**

Principles of dimensional measurement and the measurement of deflection, stress, strain, and vibration. Transducer theory and signal conditioning. Use of computer data acquisition and signal analysis. Analysis of experimental error and construction of test plans. Laboratory work leading to an experimental project.  Prerequisites: ES 253; Corequisite: MA 393

Prerequisite: ES 253. Corequisite: MA 393.

**MAE 473 - Applied Aerodynamics (3)**

Properties of the atmosphere. Aerodynamic coefficients and their dependence on Reynolds number and Mach number. Aerodynamics of airfoils, wings, and complete aircraft. Performance analysis of aerospace vehicles in atmospheric flight: range, endurance, climb, descent, takeoff, and landing. Prerequisites: ES 223, MAE 3033 and MAE 323

Prerequisite: ES 223, MAE 3033 and MAE 323.

**MAE 483 - Vehicle Structures (3)**

Introduction to the design of minimum weight structures. Design of members in tension, bending, or torsion. Design of compression members. The concept of shear flow and its use in analyzing monocoque and semi-monocoque structures. Prerequisites: MAE 353

Prerequisite: MAE 353.

**MAE 493 - Aerodynamics Laboratory (3)**

Introduction to subsonic and supersonic wind tunnel testing. Wind tunnel characteristics and data acquisition systems. Measurements of lift, drag, moments, with corresponding data reduction and aerodynamic coefficients. Turbulence factor, Reynolds and Strouhal number calculations. Airfoil, aircraft, and vehicle investigations. Supersonic measurements, including total and static pressures, Mach number, and shock angles. Engineering laboratory reports are required for each investigation. Team wind tunnel project and report is required. Prerequisite: MAE 473 or Permission of Department Chair

Prerequisite: MAE 473 or Permission of Department Chair.

**MAE 4001 - Special Problems in Mechanical Engineering (1)**

Independent study of special topics of particular interest in mechanical engineering. Course may be taken more than once with a maximum of six credit hours. Prerequisite: Permission of Department Chair

Prerequisite: Permission of Department Chair.

**MAE 4002 - Special Problems in Mechanical Engineering (2)**

Independent study of special topics of particular interest in mechanical engineering. Course may be taken more than once with a maximum of six credit hours. Prerequisite: Permission of Department Chair

Prerequisite: Permission of Department Chair.

**MAE 4003 - Special Problems in Mechanical Engineering (3)**

Independent study of special topics of particular interest in mechanical engineering. Course may be taken more than once with a maximum of six credit hours. Prerequisite: Permission of Department Chair

Prerequisite: Permission of Department Chair.

**MAE 4004 - Special Problems in Mechanical Engineering (4)**

Independent study of special topics of particular interest in mechanical engineering. Course may be taken more than once with a maximum of six credit hours. Prerequisite: Permission of Department Chair

Prerequisite: Permission of Department Chair.

**MAE 4005 - Special Problems in Mechanical Engineering (5)**

Independent study of special topics of particular interest in mechanical engineering. Course may be taken more than once with a maximum of six credit hours. Prerequisite: Permission of Department Chair

Prerequisite: Permission of Department Chair.

**MAE 4006 - Special Problems in Mechanical Engineering (6)**

Independent study of special topics of particular interest in mechanical engineering. Course may be taken more than once with a maximum of six credit hours. Prerequisite: Permission of Department Chair

Prerequisite: Permission of Department Chair.

**MAE 4023 - System Dynamics & Controls (3)**

Analysis of dynamic systems using free body diagrams, equation of motion, differential equations, and transfer functions. Introduction to Laplace transforms and solving for time history of dynamic systems. Experimental verification of analytical solutions. Analysis of hydraulic, thermal, and electrical systems. Analysis of first, second, and higher order systems, and analysis of effect of proportional, integral and derivative controls. Experimental verification of PID control analysis, time permitting. Prerequisites: ES 223, MA 233

Prerequisite: ES 223, MA 233.

**MAE 4053 - Mechanical Engineering Design I (3)**

Introduction to design methodology and practice. Product specifications. Concept generation and selection. Product design. Design for manufacturing. Economics of product development. Prototyping. Teams of students work on a design project in the area of mechanical engineering. Design project work will continue in MAE 4063. Prerequisites: MAE 303, MAE 353, MAE 3033, ES 313, (MAE 373 or CO-050)

Prerequisite: MAE 303, MAE 353, MAE 3033, ES 313, (MAE 373 or CO 050).

**MAE 4063 - Mechanical Engineering Design II (3)**

Conclusion of mechanical engineering design project. Preparation of a formal written design report and oral presentation of the design. Course must be taken the semester immediately following MAE 4053. Prerequisite: MAE 4053

Prerequisite: MAE 4053.

**MAE 4123 - Power Generation (3)**

Topics include: design of a power plant to meet specified energy demand. Selection and/or synthesis of principal components and pollution control equipment. Performance optimization, instrumentation, and control. Prerequisite: MAE 323

Prerequisite: MAE 323.

**MAE 4133 - Internal Combustion Engines (3)**

Introduction to internal combustion engines. A study of gas cycles and combustion thermodynamics. Analysis of overall engine performance characteristics, heat and mass transfer, friction, and emissions. Prerequisite: MAE 323, MAE 333 or MAE 3033, ES 343

Prerequisite: MAE 323, MAE 333 or MAE 3033, ES 343 .

**MAE 4143 - Physical Metallurgy (3)**

Course explores the underlying structure-property relationships of metals. Topics include: thermodynamics and kinetics of phase transformations, diffusion, dislocation behavior, strengthening mechanisms, fracture mechanisms, crystallography, creep,

and fatigue behavior. Laboratory work in fractography, scanning electron microscopy, fracture, tensile properties, and metallography. Prerequisite: MAE 443 or grade of "C" or better in ES 233

Prerequisite: MAE 443 or grade of "C" or better in ES 233.

**MAE 4163 - Introduction to Rocket Propulsion (3)**

This course introduces the analysis of rocket propulsion motors and engines. The basics of mission analysis, trajectory analysis and nozzle performance will be discussed. Moreover, combustion and heat transfer will be applied in a rocket context. The performance of solid motors, liquid engines, and hybrid engines will be explored including solid and hybrid rocket internal ballistics and liquid rocket engine cycle analysis. Prerequisite: MAE 323

Prerequisite: MAE 323.

**MAE 4173 - Gas Turbines (3)**

Topics include: basic theory of gas turbine engines. Study of the aerothermodynamics of propulsion, component characteristics, overall engine performance, and introduction to engine design. Prerequisites: MAE 3033 and MAE 323

Prerequisite: MAE 3033 and MAE 323.

**MAE 4183 - Aircraft Stability & Control (3)**

The linearized equations of motion for atmospheric flight are developed. Longitudinal and lateral motions of the airplane are studied with particular emphasis on the phugoid, short-period, dutch-roll, and spiral motions. Static stability and control requirements for airplane design are considered. Prerequisite: MA 233, MAE 473, MAE 4023

Prerequisite: MA 233, MAE 473, MAE 4023.

**MAE 4193 - Metal Casting (3)**

This course covers the casting process from the perspective of engineering design. Tooling design for casting processes, melt quality control, heat transfer and fluid mechanics applications in casting, dynamics of mold interaction with the cast metal. Commercial software applications are included in solidification modeling and melt chemistry control. Prerequisite: MAE 242 or consent of instructor

Prerequisite: MAE 242 or consent of instructor.

# MA-Mathematics

**MA 033 - Elementary Algebra (3)**

Topics include: basic Algebra, signed numbers, polynomial rational expressions, factoring, linear equations, graphs, linear systems. This is a non-credit, preparatory class.

**MA 0304 - Individualized Algebra I (4)**

(For non-traditional students.) This is a non-credit, preparatory class.

**MA 113 - College Algebra (3)**

Topics include: solving equations, complex numbers, interval notation, graphing functions, transformations of functions, combining functions, composite functions, inverse functions, and systems of equations in two variables.

**MA 123 - Trigonometry (3)**

Topics include: Trigonometric functions, identities, inverses, unit circle, solutions of triangles, trigonometric equations, complex numbers, radian measure, angular velocity. Prerequisite: Adequate SAT/ACT Mathematics score or approval from mathematics Department Chair.

Prerequisite: Adequate SAT/ACT Mathematics score or approval from mathematics Department Chair.

**MA 124 - Precalculus (4)**

Topics include: review of algebraic expressions, linear systems, partial fractions, synthetic division, matrices, slope, fractional exponents, exponential and logarithmic relations, Trigonometric functions, identities, inverses, vectors, polar coordinates, conic sections, summation notation, and elementary series. Prerequisite: Three years of high school mathematics and adequate SAT/ACT Mathematics score or approval from mathematics Department Chair.

Prerequisite: Three years of high school mathematics and adequate SAT/ACT Mathematics score or approval from mathematics Department Chair.

**MA 133 - Quantitative Reasoning (3)**

A survey of skills for understanding quantitative data in modern life and making decisions based upon quantitative information. This course focuses on: problem-solving and the application of mathematical concepts (such as measurement, geometry, statistics, and algebra) in various contexts. Interpretation (and misinterpretation) of percentages, probabilities and statistics in contemporary decision-making; understanding of survey and experimental results as reported in context; and making logical and persuasive quantitative arguments. Examples incorporating mathematical arguments will be taken from a wide variety of fields. Prerequisite: adequate SAT/ACT Mathematics score or approval from mathematics Department Chair.

Prerequisite: adequate SAT/ACT Mathematics score or approval from mathematics Department Chair.

**MA 134 - Calculus I (4)**

Topics include: limits, continuity, differentiation, applications, definition of the integral, and fundamental theorem of integral calculus.

Prerequisite: Three years of high school mathematics, including trigonometry, and adequate SAT/ACT Mathematics score or approval from Mathematics Department Chair.

**MA 143 - Discrete Mathematics (3)**

A survey of mathematical topics not related to calculus. Topics include set, logic, combinatorics, matrices and discrete probability; make applications in each of these areas.

**MA 153 - Finite Math (3)**

Topics include: set operations, introduction to logic, mathematics of finance, introduction to probability and statistics. Not open to engineering/science majors. Prerequisite: Two years of high school mathematics

Prerequisite: Two years of high school mathematics.

**MA 163 - Applied Math w/Business Concepts (3)**

The course provides students with further knowledge of algebraic applications, building on concepts learned in earlier courses. The course will enable students to make sound personal and business financial decisions and will address financial management issues in both realms. Topics include calculating percentages, compound interest, annuities, amortization, and other topics in business.

Prerequisite: none. Corequisite: none. Crosslisted as: none.

**MA 164 - Calculus II (4)**

Topics include: integration evaluation techniques, improper integrals, applications of integration, infinite sequences and series, parametric equations, polar coordinates.

Prerequisite: “C” or better in MA 134 or equivalent.

**MA 164H - HONORS CALCULUS II (4)**

This is the honors section of Calculus II. It satisfies all course requirements as does MA 164. Students meet for lecture three days of the week. Additionally, students are assigned to "project groups" which convene weekly without instructor supervision. In addition to the standard calculus topics (e.g., integration evaluation techniques, improper integrals, applications of integration, infinite sequences and series, parametric equations, polar coordinates) the honors section moves at a faster pace and focuses on advanced problem-solving techniques in a team environment. Note: The student must earn a grade of "C" or better in MA 164H to later enroll in MA 213 Calculus III.

Prerequisite: "C" or better in MA 134 or equivalent. .

**MA 173 - Essential Calculus (3)**

This course introduces students to basic concepts in the field of calculus. Topics include: limits, introduction to differential and integral calculus with applications, and fundamental theorem of integral calculus with applications. Prerequisite: MA 113

Prerequisite: MA 113.

**MA 184 - Mathematics for Elementary Teachers I (4)**

Topics include: numeration systems, set theoretic development of whole number system, decimals, percents, ratios, elementary number theory, elementary algebra, and problem solving techniques. Designed specifically for elementary and middle school curricula emphasizing NCTM standards.

**MA 194 - Mathematics for Elementary Teachers II (4)**

Topics include: linear, angular, area, and volume measure. Metric system, congruence, and similarity in geometric figures, probability, and statistics. Designed specifically for elementary and middle school curricula emphasizing NCTM standards. Prerequisite: MA 184

Prerequisite: MA 184.

**MA 1043 - Intermediate Algebra (3)**

Topics include: linear equations, functions, graphing, exponents, factoring, radicals, rational exponents, and applications. This course does not apply to any general education math requirement.

**MA 203 - Discrete Math for Information Sciences (3)**

An introduction to methods of analytical, abstract and critical thinking, deductive reasoning, and logical and mathematical tools used in information sciences. The topics include propositional and predicate logic, natural deduction proof system, sets, functions and relations, proof methods in mathematics, mathematical induction and finite state machines. Prerequisites: MA 113

Prerequisite: MA 113.

**MA 213 - Calculus III (3)**

Topics include: Calculus of several variables, algebra and calculus of vectors, partial differentiation, directional derivative, multiple integrals, applications. Uses symbolic algebra software.

Prerequisite: "C" or better in MA 164 or equivalent.

**MA 233 - Differential Equations (3)**

Topics include: methods of solution for first and higher order differential equations, systems of ordinary differential equations, Laplace transforms, series solutions.

Prerequisite: C or better for MA 213 or equivalent.

**MA 253 - Statistics (3)**

Topics include: laws of probability, frequency distributions, sampling, expectation and variance, normal and sampling distributions, hypothesis testing, least squares, point, and interval estimates of parameters. Not open to engineering/ science majors. Prerequisites: MA 113

Prerequisite: MA 113.

**MA 273 - Cryptography & Compression (3)**

This course provides an introduction to the fundamental components and mathematical concepts of encryption and compression. Topics include public key and private key systems, hashing, digital signatures, and common compression algorithms for image, audio, and video formats. Prerequisites: MA 173, MA 203, and MA 253

Prerequisite: MA 173, MA 203, and MA 253.

**MA 303 - College Geometry (3)**

Topics include: the construction of various types of mathematical proofs, analysis of the properties of geometric objects in Euclidean and neutral geometry, compass and straightedge constructions.

Prerequisite: C or better in MA 164 or equivalent.

**MA 312 - Historical Aspects of Mathematics (2)**

Topics include: chronologically explore significant results in mathematics. Perspective from different cultures considered. Selected topics vary from numeration systems to algebra, geometry, probability, and calculus. Prerequisite: MA 213

Prerequisite: MA 213.

**MA 313 - Introduction to Linear Algebra (3)**

Topics include: vectors, matrices, solving systems of linear equations with matrices, computing determinants, the Invertible Matrix Theorem, subspaces, basis, dimension, and computing eigenvectors/eigenvalues. Prerequisite:

C or better in MA 164 or equivalent

Prerequisite: C or better in MA 164 or equivalent.

**MA 323 - Operations Research (3)**

Topics include: computer solution of mathematical models for decision making. Linear, dynamic and integer programming, critical path scheduling, queuing theory, game theory, resource allocation. Prerequisites: MA 253 or MA 393

Prerequisite: MA 253 or MA 393.

**MA 333 - Number Theory (3)**

Topics include: divisibility, prime numbers, Euclid’s algorithm, linear congruences, quadratic residues, numerical functions, factorization, Diophantine equations, applications, and puzzles. Potential applications include hash functions, random number generation, and encryption. Prerequisite: "C" or better in MA 343.

Prerequisite: C or better in MA 343 Introduction to Proofs.

**MA 343 - Introduction to Proofs (3)**

Topics include: logic, the construction of various types of mathematical proofs, sets, functions and relations, cardinality, and the study of the real number line. Prerequisite: C or better in MA 164

Prerequisite: C or better for MA 164. Corequisite: none.

**MA 353 - Vector Analysis (3)**

Topics include: algebra and calculus of vectors, dot and cross products, Green's and Stokes' Theorems, gradient, divergence, and curl of a vector field. Prerequisite: MA 213

Prerequisite: MA 213.

**MA 363 - Advanced Differential Equations (3)**

Topics include: Bessel and Legendre equations, eigenvalue problems, Sturm-Liouville theory, existence and uniqueness theorems for linear and nonlinear equations, stability considerations. Prerequisite: MA 233

Prerequisite: MA 233.

**MA 383 - Computer Solutions to Differential Equations (3)**

Numerical techniques for solving both ordinary and partial differential equations. Initial value and boundary valued conditions (Uses Computer.) Prerequisite: MA 233 and high level programming language

Prerequisite: MA 233 and high level programming language.

**MA 393 - Probability & Statistics (3)**

Topics include: finite probability, distributions, data analysis, sampling and sampling distributions, hypothesis tests, regression and correlation analysis, analysis of variance, design of experiments. Prerequisite: MA 213

Prerequisite: MA 213.

**MA 3001 - Topics in Mathematics (1)**

This would be the addition of a 300-level topics course, for instructors to use when 400-level is not appropriate. Prerequisite: MA 213 or approval of instructor. The instructor may also set a higher prerequisite if needed.

Prerequisite: MA 213 or approval of instructor. The instructor may also set a higher prerequisite if needed.

**MA 3002 - Topics in Mathematics (2)**

This would be the addition of a 300-level topics course, for instructors to use when 400-level is not appropriate. Prerequisite: MA 213 or approval of instructor. The instructor may also set a higher prerequisite if needed.

Prerequisite: MA 213 or approval of instructor. The instructor may also set a higher prerequisite if needed.

**MA 3003 - Topics in Mathematics (3)**

This would be the addition of a 300-level topics course, for instructors to use when 400-level is not appropriate. Prerequisite: MA 213 or approval of instructor. The instructor may also set a higher prerequisite if needed.

Prerequisite: MA 213 or approval of instructor. The instructor may also set a higher prerequisite if needed.

**MA 3093 - Probability (3)**

Basic concepts of probability, including counting arguments based on combinations and permutations; discrete random variables; continuous random; moment generating functions; joint, marginal and conditional densities; expected value operators; and special distributions. Prerequisite: MA 164

Prerequisite: MA 164.

**MA 3123 - Honors Game Theory (3)**

Games are a fundamental part of human life, both recreational and professional. This course will explore the mathematical theory of two-player games of no chance. Students will learn how to assess a game’s strategy and properties through the use of

mathematics, especially combinatorics. The capstone of the course will involve students pursuing original research into a question they devise regarding games. Prerequisite: MA 143 or MA 164 or permission of departmental chair

Prerequisite: MA 143 or MA 164 or permission of departmental chair.

**MA 3193 - Financial Mathematics (3)**

Fundamental concepts of financial mathematics, and how those concepts are applied in calculating present and accumulated values for various streams of cash flows as a basis for future use in: reserving, valuation, pricing, asset/liability management, investment income, capital budgeting and valuing contingent cash flows. Prerequisite: MA 164

Prerequisite: MA 164.

**MA 3293 - Advanced Probability & Statistics (3)**

This course is a continuation of both MA 393 and MA 3093. Topics include random sampling, statistical inference, methods of estimation, estimators and their properties, confidence intervals of unknown parameters, and test hypotheses. Prerequisite: MA 393 and MA 3093

Prerequisite: MA 393 and MA 3093.

**MA 403 - Real Analysis (3)**

A modern topological approach to real analysis. Selected concepts include bounded, open, closed sets, connectedness, completeness and compactness, functions, sequences, limits, continuity, series, differentiation, and integration. Prerequisite: C or better in MA 343

Prerequisite: C or better in MA 343. Corequisite: None.

**MA 404 - Individualized Intermediate Algebra (4)**

(For non-traditional students.) This is a non-credit, preparatory class. Prerequisite: Equivalent of high school Algebra I

Prerequisite: Equivalent of high school Algebra I.

**MA 413 - Advanced Linear Algebra (3)**

Topics include: vector spaces and subspaces over a field, basis, dimension, rank, nullity, linear transformations, the determinant function, eigenvalues, diagonalizability, the Cayley-Hamilton Theorem, and the Jordan canonical form. Prerequisites: “C” or better in MA 343 and "C" or better in MA 313 or equivalent.

Prerequisite: “C” or better in MA 343 and MA 313 or equivalent. Corequisite: none.

**MA 423 - Complex Variables (3)**

Topics include: complex numbers and functions, analytic functions, Cauchy-Riemann equations, Cauchy theory, Taylor and Laurent series, contour integration, and calculus of residues. Prerequisites: C or better in MA 213 and C or better in MA 343

Prerequisite: C or better in MA 213 and C or better in MA 343.

**MA 433 - Introduction to Mathematical Cryptography (3)**

An introduction to modern cryptography emphasizes the mathematics behind the theory of public key cryptosystems and digital signature schemes. The course focuses on these key topics while developing the mathematical tools needed for the construction and security analysis of diverse cryptosystems. Prerequisite: 'C' or higher in MA 333

Prerequisite: 'C' or higher in MA 333.

**MA 443 - Numerical Analysis (3)**

Topics include: numerical solution of algebraic and transcendental equations, numerical differentiation and integration, linear

systems, eigenvalues, curve fitting and two dimensional problems. (Uses computer.) Prerequisite: MA 213

Prerequisite: MA 213.

**MA 453 - Point-Set Topology (3)**

Topics include: construction of various topologies, separation axioms, continuity and homeomorphisms, connectedness, compactness, countability axioms, Urysohn's Lemma and Tychonoff's Theorem. Prerequsite: C or better for MA 343

Prerequisite: C or better for MA 343. Corequisite: none.

**MA 473 - Graph Theory & Combinatorics (3)**

A study of discrete mathematics with special emphasis on construction and analysis of mathematical models using combinatorics, graph theory, and other discrete methods with application in a wide variety of areas. Incorporates mandatory group research projects.

Prerequisite: C or better in MA 213 or equivalent.

**MA 483 - Mathematics Capstone I (3)**

An introduction to mathematical research. Students will explore myriad depositories of mathematical writing, and write a literature review for what will be the topic for their MA 493 (Capstone II) project.

Prerequisite: Junior or Senior standing and declared major in mathematics.

**MA 493 - Mathematics Capstone II (3)**

The culminating project of a mathematics major or minor. Students will research a topic in mathematics and write significant paper about a topic beyond the scope of the undergraduate curriculum. The paper may be either expository or an original work. Student must present their research in a public forum.

Prerequisite: MA483.

**MA 4001 - Special Problems in Mathematics (1)**

Selected topics may include, but not limited to, advanced differential equations, modern algebra, boundary-values problems, probability and statistics, topology, transform calculus. Arranged with permission of Department Chair. Prerequisite: Instructor approval

Prerequisite: Instructor Approval.

**MA 4002 - Special Problems in Mathematics (2)**

Selected topics may include, but not limited to, advanced differential equations, modern algebra, boundary-values problems, probability and statistics, topology, transform calculus. Prerequisite varies by topic.

Prerequisite: Prerequisite varies by topic.

**MA 4003 - Special Problems in Mathematics (3)**

Selected topics may include, but not limited to, advanced differential equations, modern algebra, boundary-values problems, probability and statistics, topology, transform calculus. Arranged with permission of Department Chair. Prerequisite: Instructor Approval.

Prerequisite: Instructor Approval.

**MA 4013 - Abstract Algebra (3)**

A study of fundamental algebraic structures. Topics include: groups, rings, integral domains, and fields, and morphisms between these objects. Prerequisite: C or better in MA 343

Prerequisite: C or better in MA 343. Corequisite: none.

**MA 4023 - Abstract Algebra II (3)**

Topics include: classification of rings, field extensions, finite fields, Galois Theory, Constructability of Numbers, the Fundamental Theorem of Algebra, Insolvability of the Quintic, Elementary Antiderivatives. Prerequisite: “C” or better in MA 313 and MA 4013

Prerequisite: “C” or better in MA 313 and MA 4013.

**MA 4023 - Abstract Algebra II: Fields and Galois Theory (3)**

Topics include: classification of rings, field extensions, finite fields, Galois Theory, Constructability of Numbers, the Fundamental Theorem of Algebra, Insolvability of the Quintic, Elementary Antiderivatives. Prerequisite: “C” or better in MA 313 and MA 4013

Prerequisite: “C” or better in MA 313 and MA 4013.

**MA 4093 - Actuarial Modeling (3)**

The culminating project of an actuarial science major. Students will propose and pursue a problem of their choosing in collaboration with the professor. Topics may include research in the areas of actuarial science or statistics, projects in collaboration with a company working in the actuarial field, or other approved work that involves mathematical, statistical, and actuarial reasoning skills to be applied. Students will produce a final paper detailing their work and must present their work in a public forum. Students may not reuse a capstone project for another major as a substitute for this course, but furthering that work may be permitted. Prerequisite: MA 3293 or approval of department chair

Prerequisite: MA 3293 or approval of department chair.

# MGT-Management

**MGT 303 - Risk Management (3)**

This course overviews key organizational risk and crisis management issues by focusing on organizational and risk fundamentals, enterprise risk management, project management, crisis management and regulatory issues. Incorporating the concepts of effective decision making to align organizational goals with performance and crisis response.

**MGT 313 - Human Resource Management (3)**

This course includes a discussion of policies, objectives, principles and organizational structure as they pertain to personnel work. The major functions of human resources management such as staffing, performance management, human resource development, safety and health, and employee and labor relations are examined. There will be an additional focus on the impact of government laws and regulations on the human resource functions. Corequisite: MGT 363

Corequisite: MGT 363.

**MGT 323 - Leadership (3)**

This course examines leadership, influence, and power across a variety of disciplines, with a strong emphasis on ethics. This course focuses on a Transformational based approach to leadership and leadership development as well as the skills necessary for facilitating positive change in groups, organizations, and communities. Active learning opportunities to understand and practice essential skills such as continual learning, powerful communication, problem solving, managing process, goal achievement, conflict resolution, win-win negotiating, and empowering stewardship are woven throughout the course. Effective leadership practice through emphasis on strengths development is the goal of this class. Historical, literary, and contemporary examples of successful leaderships provide a framework for examining the theories and practice of leadership and power. Prerequisite: PSY 113 or SM 393

Prerequisite: PSY 113 or SM 393.

**MGT 333 - Supervision (3)**

This course is intended for people who are, or plan to be, first line supervisors. Its purpose is to present basic principles that will assist in developing the talent needed to direct other people. Skill building cases and incidents are part of the course content. Prerequisite: BA 123 or PSY 113

Prerequisite: BA 123 or PSY 113.

**MGT 343 - Human Resource Development (3)**

This course is a study of processes, methods, theories, and current practices in training and staff development in business and organizational settings. The course focuses on practices that facilitate learning and change to achieve organizational objectives. Prerequisite: MGT 313

Prerequisite: MGT 313.

**MGT 353 - Designing Operations (3)**

This course examines the central concepts of designing operations in both manufacturing and service enterprises. Topics include process strategy, location and layout strategy, job design, quality management, planning, productivity, and the design of goods and services. Prerequisites: MA 173

Prerequisite: MA 173.

**MGT 363 - Organizational Behavior (3)**

This course examines the manager's role in dealing with behavior at all organizational levels. It emphasizes the need for interpersonal and group skills. Applications of behavioral science concepts and findings to organizational situations are included. Topics include motivation, communications, leadership, conflict, and change. Prerequisite: BA 123 or PSY 113

Prerequisite: BA 123 or PSY 113.

**MGT 373 - Facility Management (3)**

This course will expose students to the key concepts of facility management. Topics include identifying core versus non-core business activities, budgeting and resource allocation, short and long term facility maintenance, facility supervision, workplace design, spatial management, energy conservation, construction structures and materials, and building services (sewer/water, gas, energy distribution, heating, ventilation, air conditioning). Students will be exposed to different types of facilities and the specific considerations for each type of facility. Prerequisite: BA 123 or PSY 113

Prerequisite: BA 123 or PSY 113.

**MGT 383 - Principles of Project Management (3)**

This course will expose students to the key concepts of project management. Topics include project planning, implementation and controlling, time management, budgeting, resource allocation, quality, human resource considerations, negotiations, scheduling, and auditing. Students will also be exposed to project management software, tools, and methods used by project managers, and event management issues. (Same as HR 403) Prerequisite: BA 123

Prerequisite: BA 123. Crosslisted as: HR 403.

**MGT 403 - Principles of Hospitality Management (3)**

This course will expose students to the many facets of the hospitality and tourism industry. Topics to be included will be the policies, procedures, marketing, promoting, pricing, and planning of the wide range of operations. This class will incorporate both classroom and field experiences so that the student understands what is required to be successful in this very diverse industry. Prerequisite: BA 123, MK 203, and ENG 143 or ENG 133

Prerequisite: BA 123, MK 203, and ENG 143 or ENG 133.

**MGT 413 - Management Of Quality (3)**

This course examines principles of quality management and continuous improvement in manufacturing and services enterprises. The focus is on using key quality tools, including statistical process control, pareto charts, flow charts, cause-effect diagrams, etc. Prerequisites: MA 253 and MGT 353

Prerequisite: MA 253 and MGT 353.

**MGT 423 - Supply Chain Management (3)**

This course examines the strategic framework of supply chain management. Students are exposed to the key factors of building and maintaining global supply chains for competitive advantage. Topics covered include aggregate planning, inventory, warehousing, distribution, pricing, sourcing, risk, sustainability and information management. It integrates these areas through analysis of case studies and topical readings. Prerequisites: MGT 353 or MGT 373

Prerequisite: MGT 353 or MGT 373.

**MGT 443 - Managing Operations (3)**

This course examines contemporary operations management principles and practices. Topics include project management, inventory management, aggregate planning, supply chain management, materials requirement planning, lean manufacturing, and just-in-time principles. Prerequisites: MA 253 and MGT 353

Prerequisite: MA 253 and MGT 353.

**MGT 453 - Strategic Management (3)**

This course requires a knowledge of all functional areas of business. It integrates these areas through analysis of case histories and related readings. Class discussion, presentations and written reports are used extensively. This course is the capstone business course and should be taken the last semester before graduation. Prerequisite: Senior standing (last two semesters of school)

Prerequisite: Senior standing (last two semesters of school).

**MGT 463 - Small Business Management (3)**

This course examines the preparatory steps necessary to launch a small business enterprise, as well as manage the everyday complexities of cash flow, marketing, staffing, pricing, purchasing, and advertising. Its purpose is to present the many competencies needed to operate a small business successfully in the competitive environment of the 21st century. Case analysis and personal interviews are the primary integral components of the course content. Prerequisites: FIN 303 and MGT 353

Prerequisite: FIN 303 and MGT 353.

**MGT 473 - Capsim Business Simulation (3)**

This course will explore business strategy through the use of a business simulation. Students will be organized into teams, given a simulated high-tech company to manage, and placed into competition with other teams for four simulated years. The simulation focuses on the functional areas of research and development, marketing, production and finance. In addition, students will have assignments to complement the simulation.

Prerequisite: Completion of all business core courses or permission of the Dean. Corequisite: None.

**MGT 483 - Capstone (3)**

This course will require the student to integrate and synthesize previous course work in the business core to complete a comprehensive final project, which demonstrates mastery of pedagogy and knowledge. As the culminating final project of a business program, it will assess the student’s mastery of the business program outcomes.

Prerequisite: Completion of all business core courses or permission of the Dean of the College of Graduate and Professional

Studies.

**MGT 493 - Select Topics (3)**

Offered to treat specific or current business or management issues in depth.

**MGT 543 - Operations Strategy & Management (3)**

Throughout this course, students will examine the central role of operations in both manufacturing and service enterprises. Additionally, this course will cover quality management, design of goods and services, layout, scheduling, project management, inventory management, supply chain management, and purchasing activities within the firm.

Prerequisite: None.

**MGT 5013 - Advanced Plant Management (3)**

Systems and methods associated with planning and monitoring in the manufacturing environment including forecasting, master production scheduling, materials requirement planning, and shop floor engagement. Integrated aspects of manufacturing resource planning and enterprise resource planning as well as the effects of just-in-time administration and the theory of constraints. Prerequisite: Graduate standing

Prerequisite: Graduate standing.

**MGT 5093 - Business Strategy & Decision Making (3)**

This course is to improve business decision-making skills and to provide strategies for development as a manager or executive. Topics covered include how individuals and groups make decisions and solve problems, individually and in organizations. By the end of the course, students will understand their own decision styles and personal dispositions and make decisions more deliberately. Students will be able to use decision analysis techniques and group processes as well as integrate their values into their decisions. Prerequisite: Must be completed in final term of graduate program. This course is to improve business decision-making skills and to provide strategies for development as a manager or executive. Topics covered include how individuals and groups make decisions and solve problems, individually and in organizations. By the end of the course, students will understand their own decision styles and personal dispositions and make decisions more deliberately. Students will be able to use decision analysis techniques and group processes as well as integrate their values into their decisions. Prerequisite: Must be completed in final term of graduate program.

Prerequisite: Must be completed in final term of graduate program.

# MK-Marketing

**MK 203 - Marketing (3)**

The marketing activities necessary to provide goods and services to target customers are examined, as well as the role marketing plays in the social and economic system. The marketing variables of product, promotion, placement, and price are considered in the context of strategic planning, implementation, and control. Prerequisites: BA 123

Prerequisite: BA 123.

**MK 313 - Retail Management (3)**

This is the study of the role of retailing in the domestic and international marketing process. A functional approach is taken in the study of retailing topics of placement, promotion, pricing, inventory control. Also examined are the consumer purchasing behavior and lifestyle profiles to understand growth of nontraditional channels. Prerequisite: MK 203

Prerequisite: MK 203.

**MK 323 - Integrated Marketing Communication (3)**

The integrated approach to marketing communications is emphasized. Advertising, sales promotion, database/direct marketing,

public relations, sponsorship/event marketing, support media, trade promotions, internet marketing, personal selling, and their coordination through a common brand and theme are investigated. Prerequisites: MK 203, SP 203 or COM 163

Prerequisite: MK 203, SP 203 or COM 163.

**MK 363 - Commerce and Consumer Behavior (3)**

Studies in this course include consumer and organizational buying behavior, as well as determinants of this behavior. Consumer characteristics, including attitudes and behaviors, processing of information, as well as consumer cultural, psychological and communication theories are also studied. Course also examines organizational efforts to use consumer behavior in the marketspace and marketplace to promote products and services.

Prerequisite: MK 203. Crosslisted as: PSY 3063.

**MK 373 - Graphic Design Fundamentals (3)**

Students will gain design theory, knowledge and experience applying the design process, design principles and design elements to plan and implement ideas and experiences with visual and textual content into industry-quality graphic design projects. Prerequisite: Junior standing

Prerequisite: Junior standing.

**MK 423 - Professional Selling (3)**

This course examines the impact of professional selling in today's competitive marketplace. Topics examined are analyzing buyer needs, planning effective presentations, developing a professional selling process, human motivation, account relationship, employee compensation and economic incentives along with ethical decision-making. Prerequisite: MK 203, SP 203

Prerequisite: MK 203, SP 203.

**MK 433 - Marketing Strategy (3)**

Content will explore the processes and methods for identifying and selecting marketing strategies that build brand equity. Course will utilize marketing concepts, consumer behavior theories, and marketing research data as well as explore the changing environments and systems. Prerequisite: MK 203 and MK 363

Prerequisite: MK 203 and MK 363.

**MK 453 - Strategic Digital Marketing Certification (3)**

Throughout this course, students will examine a number of digital marketing tools and the complexity of today's customers. Students will learn the skills needed to design, analyze, and evaluate email, content, social and search strategies for marketers' success. In this course, students will complete a suite of market-leading digital marketing and social media certification programs and use their acquired skills to make data-rich, strategic decisions about marketing strategy development and implementation. Prerequisite: MK 203

Prerequisite: MK 203. Corequisite: None.

**MK 463 - Marketing Research (3)**

Students learn successful marketing strategies for collecting and analyzing information during the research process. Data related to consumer research and insight are explored. Global dimensions of research and ethical considerations are covered. Prerequisites: MA 253 and MK 203

Prerequisite: MA 253 and MK 203.

**MK 473 - Digital Advertising (3)**

Throughout this course, students will examine the digital advertising strategies used in today's business world. Key digital

marketing strategies that students will explore include on- and off-site SEO, paid search marketing, online advertising, and email marketing. Additionally, students will develop skills in production, implementation, and recommendation of digital marketing leading to business or product success.

Prerequisite: MK 203. Corequisite: None.

**MK 483 - Senior Seminar in Marketing (3)**

This is an integrative capstone course which brings together all the functional areas of marketing. The focus is on decision-making and problems in marketing strategy. Students will study marketing considerations and responses to changes in the customer, legal, trade, technological and regulatory environments. This course includes the preparation and organization of a comprehensive marketing plan. Prerequisite: MK 203, MK 463, and Senior standing (last two semesters of school)

Prerequisite: MK 203, MK 463, and Senior standing (last two semesters of school).

**MK 493 - Selected Topics in Marketing (3)**

This class will utilize lectures, discussions, exercises and group projects to explore current marketing topics in order to strengthen observation, analytical, research and communication skills. Prerequisites: MK 203

Prerequisite: MK 203.

**MK 6513 - Services Marketing (3)**

This course will examine how services dominate the US economy and are becoming critical for competitive advantage in companies across the globe and in all industry sectors. Students will determine the unique service approaches to marketing, management, operations, and strategy required to be successful. Students will discuss the development and execution of these strategies. This course is designed to prepare students to function as effective executives in a service economy.

Prerequisite: None. Corequisite: None. Crosslisted as: None.

**MK 6523 - Sales Management (3)**

In today's dynamic world, the goal of Sales Management is to examine the elements of an effective sales force as a key strategic component of an organization's total marketing program. This course will cover all facets of sales management, including analyzing the sales process; ethical sales management decision making; sales force structure selection; sales forecasting; territory management; selecting, training, motivating, supervising and compensating the sales force; and potential solutions towards typical sales management problems.

Prerequisite: None. Corequisite: None. Crosslisted as: None.

**MK 6943 - Strategic Marketing Management (3)**

This course examines the collective marketing activities (pricing, promotion, placement, and product) as they relate to the target market. The strategic planning process and how it relates to the overall profitability of the marketing department and a corporate structure will be studied.

# MRE-Mechatronics Robotics Engr

**MRE 262 - Robotics Lab & Introduction to Programmable Logic Controllers (2)**

Experimental and project based introduction to Programmable Logic Controllers, electrical measurement, power and signals, Boolean logic, characterization of passive circuits, and measurements of time/frequency response. Corequisite: ECE 213

Corequisite: ECE 213.

**MRE 313 - Fluid Power Systems & Design (3)**

Using principles of fluid motion and fluid statics to design machines, which perform motion/work to specifications. Design of

system for particular task performance under constraints. Prerequisites: ES 213

Prerequisite: ES 213.

**MRE 323 - Robotic Kinematics & Kinetics (3)**

Forward and inverse kinematics. Design trajectory for robotic arm/end-effector and kinetic requirements for robotic joints. Prerequisite: MAE 303

Prerequisite: MAE 303.

**MRE 403 - Machine Communications (3)**

Control and Protocols used in communication between modern networked machines (or components of them). Examples are Modbus/HART. Discussion of standards. This course builds on Microcontrollers and Mechatronics. Prerequisite: ECE 273

Prerequisite: ECE 273.

**MRE 463 - Advanced Mechatronics (3)**

Discrete sensors (principles and applications). Advanced topics and current technology, SLAM (simultaneous localization and mapping), Vision systems, HMIs, IOT, and AI. Prerequisite: MRE 323

Prerequisite: MRE 323.

**MRE 4023 - System Dynamics & Controls (3)**

The development of linear models in terms of state-variable equations, input-output differential equations, and transfer functions. The introduction of both time-domain solutions and Laplace transforms. Development of time constants, damping ratios, and transfer functions. Poles and zeros, and frequency-response. The application of feedback modeling and design tools including: root-locus diagrams, bode plots and PID control. Prerequisites: ES 223 and MA 233

Prerequisite: ES 223 and MA 233. Corequisite: Lab Required.

**MRE 4053 - Mechatronics & Robotics Engineering Design I (3)**

Introduction to design methodology and practice. Product specifications. Concept generation and selection. Product design. Design for manufacturing. Economics of product development. Prototyping. Teams of students work on a design project in the area of mechatronics and robotics engineering. Design project work will continue in MRE 4063. Prerequisites: MRE 262, MRE 313, MRE 323

Prerequisite: MRE 262, MRE 313, MRE 323 .

**MRE 4063 - Mechatronics & Robotics Engineering Design II (3)**

Conclusion of mechatronics and robotics engineering design project. Preparation of a formal, written design report and oral presentation of the design. Course must be taken the semester immediately following MRE 4053. Prerequisite: MRE 4053

Prerequisite: MRE 4053.

# MT-Manufacturing Technology

**MT 113 - Manufacturing Processes & Materials (3)**

A study of commonly used manufacturing processes (machining, casting, extrusion, forging and others) with emphasis on important engineering materials used in production. Materials studied include metals, plastics, ceramics, and composites. Prerequisites: ETD 173

Prerequisite: ETD 173.

**MT 123 - Introduction to AutoCAD Design (3)**

An introductory course which studies the concept of solid modeling and its application in industry. In this course students will learn the fundamentals of 2D and Solid Modeling utilizing AutoCAD software which includes the study of detail drawing creation. Prerequisites: ETD 173

Prerequisite: ETD 173.

**MT 133 - Geometric Dimensioning & Tolerancing for Manufacturing Technology (3)**

Introduction to Geometric Dimensioning and Tolerancing for Manufacturing Technology including advanced applications of dimensioning principles, tolerances, and precision dimensioning for engineering drawing. Introduction to how geometric dimensioning and tolerancing techniques are used on engineering drawings as it relates to manufacturing. Prerequisite: ETD 103

Prerequisite: ETD 103.

**MT 253 - Basic Dimensional Metrology (3)**

Emphasis on methods and principles of measuring basic physical dimensions for inspection and quality assurance/control with an emphasis on manufacturing technology. Also covered are the basics of gaging and coordinate measuring systems. Prerequisites: ETD 113 and ETD 173

Prerequisite: ETD 113 and ETD 173.

**MT 313 - Design for Manufacture & Assembly (3)**

Principles and methodologies for designing parts and products for: ease and efficiency of manufacture and assemble; maintenance and usability during the service life, along with disposal and recycling at the end of service life. Students will be able to apply DFM and quality assurance principles to lower the cost of designing, commissioning, and using new products. Prerequisites: MT 113 and MT 253

Prerequisite: MT 113 and MT 253.

**MT 323 - Use SolidWorks to Generate Working Drawings (3)**

The emphasis in this course is on being able to turn mechanically produced drawings, CAD solid models, prototypes, or sketches into working drawings. These drawings are used to manufacture components/parts into viable and economically produced products. Prerequisites: ETD 173 and ETD 113

Prerequisite: ETD 173 and ETD 113.

**MT 403 - Quality Assurance for Manufacturing Technology (3)**

This course examines the critical nature of quality assurance for producing high reliability and economically produced products. The emphasis is on how quality techniques (especially SPC) can be integrated into manufacturing processes such that products are produced reliably to exacting manufacturing specifications, with minimal scrap and downtime being created. The statistical nature of manufacturing processes is closely examined along with concepts of six-sigma and ISO 9000. Prerequisites: MA 253, MT 113, and MT 313

Prerequisite: MA 253, MT 113, and MT 313.

**MT 413 - Manufacturing Technology Capstone Proposal (3)**

A study of manufacturing systems and processes as used in Manufacturing Technology and project management. The procedures used from the start of a Manufacturing Technology design until its final production including presentations and design reports. Integration of previous work into a complete product(s) design project. Prerequisite: Senior Standing

Prerequisite: Senior standing.

**MT 423 - Manufacturing Technology Capstone Project (3)**

In this course, students will complete a comprehensive research project. Students will integrate and synthesize previous coursework and best practices into designing and manufacturing for this project. Prerequisite: MT 413.

Prerequisite: MT 413. Corequisite: none.

# MUS-Music

**MUS 101 - Sight Singing/Ear Training I (1)**

A study and application of sight singing techniques, dictation, chord recognition, error detection, and related activities. Corequisite: MUS 113

Corequisite: MUS 113.

**MUS 103 - Introduction to Theory (3)**

Music Theory is a study of basic music theory concepts including notation of pitch, rhythm and meter, scales, keys, and key signatures, intervals, triads, and seventh chords.

**MUS 112 - Piano Lab (2)**

Designed to provide students with little or no piano background fundamentals of keyboard and musicianship on the piano.

**MUS 113 - Music Theory I (3)**

A study of basic music theory concepts including notation of pitch, rhythm and meter, scales, keys and key signatures, intervals, triads and seventh chords.

**MUS 123 - Music History I (3)**

The study of composers, styles and literature and their influence on music in western culture from the Medieval period through the Baroque period.

**MUS 1010 - Applied Studies (no credit) (0)**

Designed to provide the students with private instruction on his or her principal instrument, voice or secondary instrument. The student will develop greater facility and technique along with enhanced musicianship and a better understanding of performing at a high level of competency.

**MUS 1010Z - Applied Studies (0.5)**

Designed to provide the students with private instruction on his or her principal instrument, voice or secondary instrument. The student will develop greater facility and technique along with enhanced musicianship and a better understanding of performing at a high level of competency.

**MUS 1011 - Applied Studies (1)**

Designed to provide the students with private instruction on his or her principal instrument, voice or secondary instrument. The student will develop greater facility and technique along with enhanced musicianship and a better understanding of performing at a high level of competency.

**MUS 1011Z - Applied Studies (0.5)**

Designed to provide the students with private instruction on his or her principal instrument, voice or secondary instrument. The student will develop greater facility and technique along with enhanced musicianship and a better understanding of performing at a high level of competency.

**MUS 1110 - Percussion Ensemble (no credit) (0)**

Percussion Ensemble is for musicians who are interested in improving their skills in percussion performances and performing in an ensemble designed specifically for percussion instruments. This ensemble is open to all students regardless of experience in percussion performance.

**MUS 1111 - Percussion Ensemble (1)**

Percussion Ensemble is for musicians who are interested in improving their skills in percussion performances and performing in an ensemble designed specifically for percussion instruments. This ensemble is open to all students regardless of experience in percussion performance.

**MUS 1120 - Brass Ensemble (no credit) (0)**

Brass Ensemble is open to all students and community members who play brass wind instruments. The ensemble will perform a variety of music and can accommodate diverse brass instrumentation. Prerequisite: Players must have prior playing experience on their instrument and at least moderate music reading skills. Players of small brass instruments must provide their own instrument in good working order. Larger instruments may be available from the University.

Prerequisite: Players must have prior playing experience on their instrument and at least moderate music reading skills. Players of small brass instruments must provide their own instrument in good working order. Larger instruments may be available from the University.

**MUS 1121 - Brass Ensemble (1)**

Brass Ensemble is open to all students and community members who play brass wind instruments. The ensemble will perform a variety of music and can accommodate diverse brass instrumentation. Prerequisite: Players must have prior playing experience on their instrument and at least moderate music reading skills. Players of small brass instruments must provide their own instrument in good working order. Larger instruments may be available from the University.

Prerequisite: Players must have prior playing experience on their instrument and at least moderate music reading skills. Players of small brass instruments must provide their own instrument in good working order. Larger instruments may be available from the University.

**MUS 1130 - Choral Concourse (no credit) (0)**

The Choral Concourse is a large, mixed, vocal ensemble that will meet one evening a week and consist of Trine University students and community members. This ensemble will perform a variety of music and provide students and community members a secular vocal ensemble that rehearses in the evening. Prerequisite: General knowledge of reading music and singing ability.

Prerequisite: General knowledge of reading music and singing ability.

**MUS 1131 - Choral Concourse (1)**

The Choral Concourse is a large, mixed, vocal ensemble that will meet one evening a week and consist of Trine University students and community members. This ensemble will perform a variety of music and provide students and community members a secular vocal ensemble that rehearses in the evening. Prerequisite: General knowledge of reading music and singing ability.

Prerequisite: General knowledge of reading music and singing ability.

**MUS 1140 - Chamber Orchestra (no credit) (0)**

The Chamber Orchestra is a performance ensemble designed for in-depth study, preparation and performance of all types of chamber orchestra literature. The Chamber Orchestra will play a mixture of string orchestra and full orchestra music. The ensemble performs at concerts and special events. Open to all university students. Prerequisite: Previous experience in an instrumental ensemble is preferred.

Prerequisite: Previous experience in an instrumental ensemble is preferred.

**MUS 1141 - Chamber Orchestra (1)**

The Chamber Orchestra is a performance ensemble designed for in-depth study, preparation and performance of all types of chamber orchestra literature. The Chamber Orchestra will play a mixture of string orchestra and full orchestra music. The ensemble performs at concerts and special events. Open to all university students. Prerequisite: Previous experience in an instrumental ensemble is preferred.

Prerequisite: Previous experience in an instrumental ensemble is preferred.

**MUS 1150 - Marching Band (no credit) (0)**

The Marching Band is a performing ensemble designed to bring excitement and enthusiasm to Thunder football games and other special events and to offer the students of Trine University the opportunity to perform in a collegiate marching band with all of its spectacle and showmanship. Prerequisite: Previous experience in an instrumental ensemble is preferred.

Prerequisite: Previous experience in an instrumental ensemble is preferred.

**MUS 1151 - Marching Band (1)**

The Marching Band is a performing ensemble designed to bring excitement and enthusiasm to Thunder football games and other special events and to offer the students of Trine University the opportunity to perform in a collegiate marching band with all of its spectacle and showmanship. Prerequisite: Previous experience in an instrumental ensemble is preferred.

Prerequisite: Previous experience in an instrumental ensemble is preferred.

**MUS 1160 - Wind Ensemble/Pep Band (no credit) (0)**

Wind Ensemble/Pep Band is a performance ensemble designed for in-depth study, preparation and performance of all types of standard band literature. The ensemble performs at concerts and athletic events. Open to all university students. Prerequisite: Previous experience in an instrumental ensemble is preferred.

Prerequisite: Previous experience in an instrumental ensemble is preferred.

**MUS 1161 - Wind Ensemble/Pep Band (1)**

Wind Ensemble/Pep Band is a performance ensemble designed for in-depth study, preparation and performance of all types of standard band literature. The ensemble performs at concerts and athletic events. Open to all university students. Prerequisite: Previous experience in an instrumental ensemble is preferred.

Prerequisite: Previous experience in an instrumental ensemble is preferred.

**MUS 1170 - University Choir (no credit) (0)**

University Choir is a performance ensemble which offers students the opportunity to sing the finest choral music. Open to all university students. Prerequisite: General knowledge of reading music and singing ability.

Prerequisite: General knowledge of reading music and singing ability.

**MUS 1171 - University Choir (1)**

University Choir is a performance ensemble which offers students the opportunity to sing the finest choral music. Open to all university students. Prerequisite: General knowledge of reading music and singing ability.

Prerequisite: General knowledge of reading music and singing ability.

**MUS 1180 - Jazz Band (no credit) (0)**

Jazz Band is a performance ensemble, designed for in-depth study, preparation and performance of all types of jazz band literature from swing to Latin, rock, fusion, etc. The ensemble performs at concerts and special events. Open to all university

students. (May be taken multiple times.)

**MUS 1181 - Jazz Band (1)**

Jazz Band is a performance ensemble, designed for in-depth study, preparation and performance of all types of jazz band literature from swing to Latin, rock, fusion, etc. The ensemble performs at concerts and special events. Open to all university students. (May be taken multiple times.)

**MUS 1190 - Jazz/Show Choir (no credit) (0)**

The Jazz/Show Choir is a small audition vocal ensemble for experienced vocal musicians with good skills in sight reading, part reading, movement, and vocal production. As the name indicates, this ensemble performs music in the jazz and show genre. Prerequisite: Students must audition with class instructor and other music faculty

Prerequisite: Students must audition with class instructor and other music faculty.

**MUS 1191 - Jazz/Show Choir (1)**

The Jazz/Show Choir is a small audition vocal ensemble for experienced vocal musicians with good skills in sight reading, part reading, movement, and vocal production. As the name indicates, this ensemble performs music in the jazz and show genre. Prerequisite: Students must audition with class instructor and other music faculty

Prerequisite: Students must audition with class instructor and other music faculty.

**MUS 1200 - Musical Theatre/Opera Ensemble (no credit) (0)**

This auditioned ensemble allows the singer to not only improve musical skills but also to develop sound stage movement and performance. This small ensemble uses mainstream musicals and operas as the primary source of literature and performs key scenes form the works.

**MUS 1201 - Musical Theatre/Opera Ensemble (1)**

This auditioned ensemble allows the singer to not only improve musical skills but also to develop sound stage movement and performance. This small ensemble uses mainstream musicals and operas as the primary source of literature and performs key scenes form the works.

**MUS 201 - Sight Singing/Ear Training II (1)**

The continued study of ear training and sight singing utilizing diatonic materials. Course content includes the recognition of chords and dictation of melodic, harmonic and rhythmic material reinforcing concepts presented in MUS 101. Prerequisite: MUS 101

Prerequisite: MUS 101.

**MUS 213 - Music Theory II (3)**

The study of music theory and concepts including advanced four part writing, analysis, score study, and listening. Prerequisite: MUS 113

Prerequisite: MUS 113.

**MUS 223 - Music History II (3)**

The study of composers, styles, an overview of compositions, and their influence on music in Western culture from the Classic period through the Contemporary period.

**MUS 253 - Techniques of Conducting (3)**

The principals of baton technique. The student will develop a fluent and expressive beat style and rhythmic and aural facilities essential to successful instrumental and choral direction.

**MUS 272 - Music Appreciation (2)**

An introduction to the heritage of music culture of the Western world, including musical styles of the past and styles and forms of contemporary music literature. Previous music training not a prerequisite.

**MUS 273 - Music & Culture (3)**

An introduction to the music of the western world, including musical styles of the past and styles and forms of contemporary music literature. Previous music training not a prerequisite. This course explores how people define, create, value, and use music in cultures around the world. The basic musical elements of rhythm, melody, timbre, texture harmony, and form are explored through this multicultural approach to music appreciation.

**MUS 323 - Music Literature I (3)**

Music Literature I is a survey of masterworks, styles and forms of music from 1450 to 1900.

**MUS 363 - Recording Techniques and Sound Reinforcement (3)**

Recording Techniques and Sound Reinforcement studies digital recording systems, microphone placement, multitrack recording, multichannel mixing, signal processing, problems in multiple microphone arrays, and basic sound amplification systems.

# NRS-Nursing

**NRS 102 - Nursing Fundamentals (2)**

This course provides the foundation necessary for the nursing student to provide safe, holistic, patient-centered care to diverse populations. The content will explore and build upon foundational concepts of the nursing process, therapeutic communication, basic physiological, cultural, spiritual, psychosocial and health promotion needs of the population.

Prerequisite: Admission to the nursing program. Corequisite: none.

**NRS 103 - Nursing Fundamentals Lab (3)**

This course presents an introduction to basic nursing skills to facilitate safe care. The focus will be on the steps of the nursing process, documentation, addressing basic patient needs, standard precautions, patient safety and safe medication administration. Skills include vital signs, physical assessment, basic hygiene care, elimination, nutritional and fluid needs, sterile technique, airway support and drug dosage calculations.

Prerequisite: Admission to the nursing program. Corequisite: none.

**NRS 113 - Pharmacology for Nurses (3)**

This course focuses on the pharmacotherapeutic, pharmacodynamic, and pharmacokinetic properties of drug therapy related to the human body. The content will address all major drug classifications, the principle properties of commonly prescribed drugs and the interaction in all major body systems in humans. For each classification, the nursing student will consider data collection, safe dosage/administration including all routes, therapeutic effect, adverse reactions/interactions, and patient education.

Prerequisite: Admission to the nursing program. Corequisite: none.

**NRS 122 - Adult Nursing I Clinical (2)**

This course provides selected patient experience in a variety of settings to allow the student to apply theory and skills. The clinical focus is on beginning nursing care for medical-surgical adults with care for acute and chronic conditions. Emphasis is placed on assessment skills, the nursing process, health promotion, care plans, pharmacology and related areas of nursing care delivery. Prerequisites: NRS 102, NRS 103, and NRS 113

Prerequisite: NRS 102, NRS 103, NRS 113. Corequisite: none.

**NRS 123 - Adult Nursing I (3)**

This course introduces the nursing student to the concepts in medical-surgical nursing and care of the non-complex adult client with acute and chronic conditions. Concepts presented will emphasize the nursing process, health promotion, care plans, risk factors, pharmacology, ethics and other related areas in healthcare delivery related to nursing practice. Prerequisites: NRS 102, NRS 103, and NRS 113

Prerequisite: NRS 102, NRS 103, and NRS 113. Corequisite: none.

**NRS 132 - Adult Nursing II Clinical (2)**

This course provides selected patient experience in a variety of settings to allow the student to apply theory and skills. The clinical focus is on increasing critical thinking and providing nursing care to increased acuity for medical-surgical adults with acute and chronic conditions. Emphasis is placed on assessment skills, the nursing process, health promotion, care plans, pharmacology and related areas of nursing care delivery. Prerequisites: NRS 122 and NRS 123

Prerequisite: NRS 122, NRS 123. Corequisite: none.

**NRS 133 - Adult Nursing II (3)**

This course is a continuation of Adult Nursing I and will instruct the nursing student to increasingly complex concepts in medical-surgical nursing and care of the adult client with acute and chronic conditions. Concepts presented will emphasize critical thinking utilizing the nursing process, health promotion, care plans, multiple risk factors, pharmacology, ethics and other related areas in healthcare delivery related to nursing practice. Prerequisites: NRS 122 and NRS 123

Prerequisite: NRS 122, NRS 123. Corequisite: none.

**NRS 201 - Women's Health & Childbirth Lab (1)**

This lab course will provide the nursing student a supportive and supervised environment to practice skills sets that specifically address the managed care of women’s health and childbearing. The course will also provide simulated experiences to allow for the nursing student to practice assessments, communication, teaching/learning and managing care of women’s health and stages of childbearing. Prerequisites: NRS 113 and NRS 132 and NRS 133; Corequisites: NRS 202 and NRS 211

Prerequisite: NRS 113, NRS 132, NRS 133. Corequisite: NRS 202 and NRS 211.

**NRS 202 - Women's Health & Childbirth (2)**

This course provides foundational instruction for providing nursing care along a continuum of women’s health and childbearing. Specific content will include physiological, psychosocial, cultural and developmental needs, reproductive and sexual health, psychological and physiologic changes of pregnancy, prenatal care, labor and delivery, postpartum and care of the newborn. Prerequisites: NRS 113 and NRS 132 and NRS 133; Corequisites: NRS 201 and NRS 211

Prerequisite: NRS 113 and NRS 132 and NRS 133. Corequisite: NRS 201 and NRS 211.

**NRS 211 - Women's Health & Childbirth Clinical (1)**

This course will provide the nursing student the opportunity to observe, assess and participate in the care of women’s health and childbearing stages. The focus will be on the role of the nurse in meeting physiological, psychosocial, cultural and developmental needs of reproductive and sexual health, psychological and physiologic changes of pregnancy, prenatal care, labor and delivery, postpartum and care of the newborn. Pre-requisites: BIO 224 and NRS 113 and NRS 132 and NRS 133; Corequisites: NRS 201 and NRS 202

Prerequisite: BIO 224 and NRS 113 and NRS 132 and NRS 133. Corequisite: NRS 201 and NRS 202.

**NRS 221 - Pediatric Lab (1)**

This lab course will provide the nursing student a supportive and supervised environment to practice skills sets that specifically

address the managed care of the pediatric client. The course will also provide simulated experiences to allow for the nursing student to practice assessments, communication, teaching/learning and managing care of the pediatric client from infancy to adolescence. Prerequisites: BIO 224 and NRS 113 and NRS 132 and NRS 133; Corequisites: NRS 222 and NRS 231

Prerequisite: BIO 224, NRS 113, NRS 132, NRS 133. Corequisite: NRS 222, NRS 231.

**NRS 222 - Pediatric Nursing (2)**

This course provides foundational instruction for providing nursing care for the pediatric patient from infancy to adolescence. Specific content will include related human growth and development, physiological, psychosocial, cultural and developmental needs, health promotion and disease prevention of all pediatric age groups. Prerequisites: NRS 113 and NRS 132 and NRS 133; Corequisites: NRS 221 and NRS 231

Prerequisite: NRS 113 and NRS 132 and NRS 133. Corequisite: NRS 221 and NRS 231.

**NRS 231 - Pediatric Clinical (1)**

This course will provide the nursing student the opportunity to observe, assess and participate in the care of the pediatric client. The focus will be on the role of the nurse in addressing related human growth and development, physiological, psychosocial, cultural and developmental needs, health promotion and disease prevention of the pediatric client. Prerequisites: NRS 113 and NRS 132 and NRS 133; Corequisites: NRS 221 and 222

Prerequisite: NRS 113 and NRS 132 and NRS 133. Corequisite: NRS 221 and NRS 222.

**NRS 241 - Mental Health Nursing Clinical (1)**

This course will focus on continuing nursing knowledge and skills as related to mental health nursing. It will provide for the continued application of the nursing process, critical thinking, and caring therapeutic interventions in acute, chronic and community-based psychiatric- mental health. Prerequisites: NRS 113 and NRS 132 and NRS 133; Corequisite: NRS 242

Prerequisite: NRS 113 and NRS 132 and NRS 133. Corequisite: NRS 242.

**NRS 242 - Mental Health Nursing (2)**

This course focuses on mental health concepts and issues. Basic mental health concepts and issues examined include cultural beliefs, legal and ethic issues, therapeutic nurse-client communication and relationship, factors affecting health and wellness of client with common psychiatric health needs and disorders. Prerequisites: NRS 113 and NRS 132 and NRS 133; Corequisite: NRS 241

Prerequisite: NRS 113 and NRS 132 and NRS 133. Corequisite: NRS 241.

**NRS 251 - Advanced Care for Adults Lab (1)**

This lab course will provide the nursing student a supportive and supervised environment to practice skills sets the specifically address the managed care of the adult client with complex health alterations. The course will also provide simulated experiences to allow for the nursing student to practice assessments, communication, teaching/learning and managing care of the complex patients with multisystem health issues in order to facilitate the wellbeing within the context of critical or complex illness. Taken in the final term of enrollment. Corequisites: NRS 252 and NRS 253 and NRS 261

Prerequisite: taken in final term of enrollment. Corequisite: NRS 252, NRS 253, NRS 261.

**NRS 252 - Advanced Care for Adults Clinical (2)**

This course provides selected patient experience in a variety of settings to allow the student to apply advanced integration of complex concepts in medical-surgical nursing and care of the adult client with complex health alterations. The clinical focus is on nursing care of complex patients with multisystem health issues in order to facilitate the wellbeing within the context of critical or complex illness. Taken in final term of enrollment. Corequisites: NRS 251 and NRS 253 and NRS 261

Prerequisite: taken in final term of enrollment. Corequisite: NRS 251, NRS 253, NRS 261.

**NRS 253 - Advanced Care for Adults (3)**

This course expands theory to advanced integration of complex concepts in medical-surgical nursing and care of the adult client with complex health alterations. Focus on nursing care of complex patients with multisystem health issues in order to facilitate the wellbeing within the context of critical or complex illness. To be taken in the final term of enrollment. Co-requisites: NRS 251 and NRS 252 and NRS 261

Prerequisite: taken in final term of enrollment. Corequisite: NRS 251, NRS 252, NRS 261.

**NRS 261 - Nursing Capstone - NCLEX Prep (1)**

This course will provide students with various ethical and leadership concepts that will further strengthen rationale for nursing decisions and actions. Lifelong learning and personal/professional development will be explored. Preparation for the registered nurse licensure exam will be addressed through comprehensive NCLEX review. Taken in the final term of enrollment. Corequisites: NRS 251 and NRS 252 and NRS 253

Prerequisite: taken in final term of enrollment. Corequisite: NRS 251, NRS 252, NRS 253.

**NRS 303 - Professional Nursing Role (3)**

This course provides the foundation for advancing into the role of the professional Baccalaureate-prepared nurse. Concepts, trends, and challenges are examined from the perspective of a professional nurse. Theories are discussed and applied to issues regarding healthcare access, quality, and services. Prerequisite: Admission into the RN-BSN program

Prerequisite: Admission into the RN-BSN program.

**NRS 313 - Transcultural Nursing (3)**

This course provides the practicing nurse with theoretical knowledge that informs delivery of culturally-appropriate nursing care to individuals, families, and groups. Affords opportunity to increase cultural awareness and decrease health disparities. Economic and social factors impacting access to health care for various cultural groups are examined and discussed. Prerequisite: NRS 303

Prerequisite: NRS 303.

**NRS 323 - Complementary & Alt Therapies (3)**

This course examines nontraditional healing modalities and therapies. Analysis of the efficacy of various treatments are investigated. Pharmacological interactions and general contraindications of complementary and alternative therapies are explored. Prerequisite: NRS 303

Prerequisite: NRS 303.

**NRS 333 - Nursing Ethics (3)**

This course focuses on ethical theories and the ethical decision-making process that informs nursing practice. Appraisal of clinical dilemmas provide an opportunity to develop moral reasoning skills. Prerequisite: NRS 303

Prerequisite: NRS 303.

**NRS 343 - Nursing Informatics (3)**

This course investigates effective information management and utilization in healthcare settings. Emphasis is placed on trends and issues in clinical technology. Theoretical concepts from information science, computer science, and nursing science are incorporated into decision-making activities. Prerequisite: NRS 303

Prerequisite: NRS 303.

**NRS 353 - Health Promotion Over Lifespan (3)**

This course explores concepts in health promotion for individuals and families from birth to death. Environmental, sociocultural, and spiritual influences on health are explored. Students utilize the nursing process and develop treatment plans for individuals and families across the life span. Emphasis is placed on holistic promotion. Prerequisite: NRS 303

Prerequisite: NRS 303.

**NRS 414 - Community-Public Health Nursing (4)**

This course examines the health needs of populations within the community. Factors influencing the health of communities are investigated. Students appraise the role and core competencies of community health nurses in the prevention of disease and promotion of health. A practicum experience will focus on planning care for a selected population in the community. Prerequisite: NRS 303

Prerequisite: NRS 303.

**NRS 423 - Biostatistics & Epidemiology (3)**

This course examines basic concepts and principles of epidemiology, biostatistics, and preventative medicine related to public health practice. Epidemiological data measures and surveillance are examined. Students will identify statistical tests necessary to answer clinical questions. Principles of primary, secondary, and tertiary prevention are evaluated for appropriateness and efficacy. Prerequisite: NRS 303

Prerequisite: NRS 303.

**NRS 433 - Foundations of Research (3)**

This course provides an introduction to the research process as it relates to evidence-based nursing practice and prepares nursing students to critically evaluate evidence. Basic components of research design, ethics, sampling, data collection, analysis, and evidence-based practice are discusses. Students critique research for its application to the practice of professional nursing. Prerequisite: NRS 303

Prerequisite: NRS 303.

**NRS 443 - Global Health (3)**

This course provides an overview of global health issues. Roles of national and global healthcare agencies and the development of policy are examined. Strategies for population health equity and the utilization of resources for promoting health for populations, communities, and societies are identifies. Effectiveness of nursing practice is explored in relation to problems, priorities, attitudes, and culture. Prerequisite: NRS 303

Prerequisite: NRS 303.

**NRS 453 - Nursing Leadership & Management (3)**

This course provides a foundation for the development of leadership and management skills in nursing practice. Several theories in leadership and management relevant to professional practice are explored. Ethical, political, organizational, and regulatory influences on leading and managing in a clinical setting are discussed. Prerequisite: NRS 303

Prerequisite: NRS 303.

**NRS 484 - Professional Capstone Project (4)**

This course provides students with the opportunity to synthesize and apply acquired knowledge from core RN-BSN courses. A practicum is a required component of this course. All students will complete a capstone project reflecting mastery of RN-BSN student learning outcomes. Prerequisite: Completion of all RN-BSN courses. May take NRS 453 in the same term.

Prerequisite: This course must be taken in final semester of program.

**NRS 5101 - Transition to Graduate Nursing (1)**

This course assists the BSN prepared registered nurse transition to graduate-level academic expectations and promotes personal, professional, and leadership development. Provides an understanding of the professional graduate nurse, including collaboration, interprofessional relationships, critical thinking and decision-making. The course will introduce the development of a professional portfolio in the final capstone course.

Prerequisite: Admission to MSN program.

**NRS 5202 - Theoretical Foundations in NRS (2)**

This course analyzes the history and evolution of nursing philosophies, conceptual models, and theories. Emphasis is on the critique and evaluation of nursing and other theories relevant to nursing practice. This course explores the relationship between research, theory, and nursing practice.

Prerequisite: NRS 5101. Corequisite: NRS 5101.

**NRS 5303 - Research for Evidence-based Prac (3)**

This course builds upon previous knowledge of nursing research and evidence-based practice in order to develop proficiency in the research methods and process. Focus on critiquing, generating, and translating research findings into practice as well as ethical aspects of scholarly inquiry.

Prerequisite: NRS 5101.

**NRS 5313 - Statistics for Nursing Research (3)**

Principles and applications of scientific measurement, sampling, and statistical analysis. Focus on promoting understanding of statistical methods used in nursing studies and conducting selected statistical analysis for nursing data.

Corequisite: NRS 5101.

**NRS 5314 - Advanced Care Coordination (4)**

This course is designed to prepare registered nurses to collaborate and lead members of the healthcare team in the delivery of safe, high quality, culturally relevant, interprofessional care to diverse populations of patients in a variety of healthcare settings. Examination of political, financial, and social constructs affecting healthcare, patient access, equity, and outcomes with care coordination as the focus of the patient experience. Includes a 175-hour practicum.

Prerequisite: NRS 5101.

**NRS 5324 - Advanced Nursing Assessment (4)**

This course examines advanced pathophysiology, pharmacology, and physical assessment as well as educational theory and methods relative for nurse educators. Utilization of a program containing clinically based interactive patient encounters is designed to strengthen assessment skills and clinical competency. Learning activities include a health history, completion of a focused physical assessment, and development of a plan of care related to the patient’s condition. Students awarded 175 practicum hours.

Prerequisite: NRS 5101.

**NRS 6203 - Advanced Nursing Assessment (3)**

This course examines advanced pathophysiology, pharmacology, and physical assessment for nurse educators. Utilization of a program containing clinically based interactive patient encounters is designed to strengthen assessment skills and clinical competency. Learning activities include a health history, completion of a focused physical assessment, and development of a plan of care related to the patient's condition. Students awarded 30 practicum hours. Prerequisites: NRS 5101

Prerequisite: 5101.

**NRS 6213 - Curriculum Design in Nursing (3)**

This course focuses on the process of curriculum and program development and implementation that aligns with professional nursing standards, institutional missions, and theoretical frameworks used in nursing education. Exploration of traditional and innovative program designs as applied in various educational environments.

Prerequisite: NRS 5101 or approval from the Program Director.

**NRS 6223 - Nursing Course Development (3)**

This course prepares the nurse educator to develop innovative courses within a nursing curriculum that facilitate student learning and program effectiveness. Examines the roles that internal and external stakeholders have on the process.

Prerequisite: NRS 5101 or permission from the Program Director.

**NRS 6233 - Teaching Strategies in Nursing (3)**

This course explores the teaching and learning process in nursing education. Emphasis is placed on learning theories and evidence-based teaching strategies applicable in a variety of nursing education settings. Nurse educator roles and expectations are examined.

Prerequisite: NRS 5101 or permission from the Program Director.

**NRS 6243 - Assessment & Evaluation (3)**

This course examines assessment and evaluation strategies of learning in academic, clinical, and online nursing education. Students explore the differences between assessment and evaluation; formative and summative; test construction, item analysis, and rubrics; and evaluation of clinical performance using reliable and valid methods.

Prerequisite: NRS 5101 or permission of Program Director.

**NRS 6254 - Nurse Educator Practicum (4)**

This course provides the opportunity to function in the nurse educator role and apply acquired knowledge and skills in diverse educational settings under the guidance of an experienced preceptor. Emphasis is placed on an authentic demonstration of prior learning by designing, implementing, and evaluating lesson plans or courses. Includes 150 practicum hours.

Prerequisite: NRS 5101 or permission of Program Director.

**NRS 6313 - Foundations in Nursing Informatics (3)**

Students learn the history, principles and concepts of health informatics and nursing informatics. Students examine the fundamental ideas, concepts, and technology of information systems in healthcare. Other topics include nursing knowledge generation; ethical and social issues in healthcare informatics; and the impact of consumer informatics. Prerequisite: NRS 5101 or approval from the Program Director

Prerequisite: NRS 5101 or approval from the Program Director.

**NRS 6323 - Data Management in Healthcare (3)**

This course will concentrate on monitoring, maintaining, supporting, and evaluating data. Students also gain knowledge about standardized nomenclatures and technical standards used in information and nursing terminology. Additionally, students will explore the understanding of data analysis, application, transformation, and the use of analytics tools. Last, students will examine the use of hardware, software, and peripherals in the healthcare environment. Prerequisite: NRS 5101 or approval from the Program Director

Prerequisite: NRS 5101 or approval from the Program Director.

**NRS 6333 - SDLC & Project Management (3)**

This course covers the principles of information management in project management and planning for implementing technology solutions in healthcare and managing system-wide change. The end-to-end life cycle of technology implementation in project management involves exploring various steps, such as planning, analysis, designing, building, testing, training, implementation, monitoring, maintaining, supporting, and evaluating. Prerequisite: NRS 5101 or approval from the Program Director

Prerequisite: NRS 5101 or approval from the Program Director.

**NRS 6343 - Evaluation Methods: Informatics (3)**

This course employs an application focus where students will explore strategies for self-development in informatics competencies surrounding education, professional practice, and evaluation methodologies in nursing informatics. Prerequisite: NRS 5101 or approval from the Program Director

Prerequisite: NRS 5101 or approval from the Program Director.

**NRS 6354 - Nursing Informatics Practicum (4)**

This course emphasizes the synthesis of acquired knowledge and skill and provides an opportunity to collaborate with a nurse manager or administrator for the development of an informatics project. This course includes 150 practicum hours. This course is taken with or immediately preceding NRS 6902.

Prerequisite: This course is taken with or immediately preceding NRS 6902. Corequisite: This course is taken with or immediately preceding NRS 6902.

**NRS 6403 - Organizational Leadership in NRS (3)**

This course examines leadership skills that include communication, problem-solving, decision-making, teamwork, collaboration, professionalism and strategic management as applied in contemporary healthcare environments. Specific areas of concentration include: organizational theory and behavior, best practice strategies for implementing change, effective team building and functioning, and application of the strategic planning process.

Prerequisite: NRS 5101 or permission from Program Director.

**NRS 6413 - Healthcare Finance (3)**

This course provides a high-level understanding of financial management and concepts of healthcare systems at the executive level. Facilitates development of skills necessary to analyze costs for healthcare budgets and apply principles of business, economics, and finance.

Prerequisite: NRS 5101 or permission from the Program Director.

**NRS 6423 - Healthcare Quality Improvement (3)**

This course examines the relationship between healthcare quality, leadership, and the interprofessional healthcare team. Theories, models, and approaches to quality improvement are evaluated within the context of nursing. In-depth analysis of factors impacting quality improvement: Ethics, standards, regulations, accreditation, and law.

Prerequisite: NRS 5101 or permission from Program Director.

**NRS 6433 - Human Resources for Healthcare (3)**

This course explores human resource management practices in the healthcare setting with a focus on developing skills required of nurse leaders. Employment law, labor relations, recruitment, hiring, performance evaluation, compensation, staff development, and maintaining a positive work culture will be examined.

Prerequisite: NRS 5101 or permission of Program Director.

**NRS 6443 - Strategic Planning for Nursing (3)**

This course examines the theory of strategic planning and principles of strategic management. In-depth analysis and application of the strategic planning process includes: assessment, creation of objectives and measurements, operational strategies, and development of mission and goals. Prerequisites: NRS 5101 or approval from Program Director

Prerequisite: NRS 5101 or approval from Program Director.

**NRS 6454 - Nurse Leader Practicum (4)**

This course emphasizes the synthesis of acquired knowledge and skill and provides an opportunity to collaborate with a nurse manager or administrator for the development of a leadership project. This course includes 150 practicum hours.

Prerequisite: NRS 5101 or permission of Program Director.

**NRS 6902 - Graduate Nurse Capstone (2)**

This course provides master's level nurses to demonstrate a deeper understanding of the nursing profession, research and evidence-based practice, lifelong learning, and professional development as evidenced by mastery of graduate learning outcomes. Presentation of proposed research and completion of a professional portfolio that exhibits advanced nursing knowledge, clinical judgment, and competencies.

Prerequisite: This course is taken in the final semester/term of the MSN program.

# OTD-Doctorate of Occupational Therapy

**OTD 5111 - CARE I (1)**

The Clinical Application and Reflection Experience (CARE) series is designed to synthesize didactic learning with an experiential component that supports knowledge development, fieldwork problem-solving, and skills required to deliver occupational therapy. This introduction to fieldwork I rotation is focused on professionalism and understanding occupations. Students will be expected to demonstrate understanding and compliance with the facility's safety policies and procedures, practice appropriate and professional verbal communication, and actively listen to understand what is being communicated by patients. Students will demonstrate safety awareness and begin to develop clinical reasoning in functional mobility. A combination of community-based, clinic-based, simulation, reflective group discussions, and faculty-led experiences could be utilized to stimulate critical rationale and application of occupational therapy principles to occupational therapy practice across the lifespan.

Prerequisite: Acceptance into OTD Program.

**OTD 5113 - Occupational Therapy Fundamentals (3)**

This course explores the history and development of the occupational therapy profession as well as the philosophies informing the occupational therapy domain and process. Students will be introduced to the AOTA *Occupational Therapy Code of Ethics*, the AOTA *Standards of Practice,* and the *Occupational Therapy Practice Framework Domain Process, 4th Edition, (OTPF-4)*, as a basis for learning the varying roles of the occupational therapy professional. Official documents that guide the profession, sociocultural changes, and trends that influence modern occupational therapy practice, and the public healthcare landscape, will be discussed. An overview of essential professional, occupational therapy, and occupational science-specific terminology to promote efficient and accurate communication of occupational therapy services. A introduction of scientific evidence to support the balancing of areas of occupation and the role of occupation in the promotion of health and wellness.

Prerequisite: Acceptance into OTD Program.

**OTD 5123 - OT Theory & Behavioral Health (3)**

An introduction to occupational therapy evaluation methods for evaluating clients who experience occupational disruption secondary to behavioral and emotional well-being. Students will discuss the theoretical basis of evaluation, appropriate data-gathering methods, standardized and non-standardized assessment tools, interpretation of results, and documentation of

evaluation findings. The course will include instruction on methods for gathering information to construct an occupational profile which should include consideration of the roles that sociocultural, socioeconomic, and social determinants of health play in the client's overall health and ability to engage in occupations. This course will introduce students to the importance of balancing areas of occupation and health promotion. Corequisite: OTD 5111

Prerequisite: Acceptance into OTD Program. Corequisite: OTD 5111.

**OTD 5132 - Principles of Documentation (2)**

An overview of essential professional and occupational specific terminology to promote efficient and accurate documentation of occupational therapy services. This course will provide an overview of personal and professional responsibilities related to liability issues. Building off professional responsibilities, students will also be exposed to the purpose of documentation as well as legal and ethical issues in documentation Students will be introduced to reporting evaluation data, creating intervention plans, documenting progress notes, and establishing discharge summaries. Introduction to the consultative process with persons, groups, programs, organizations, or communities will be presented. The impact of occupational therapy services on the healthcare team and how to communicate using accepted terminology with members of the interprofessional team will be presented. Emphasis will be placed on electronic documentation systems, virtual therapeutic environments, and the delivery of occupational therapy services using telehealth technology.

Prerequisite: Acceptance into OTD Program.

**OTD 5133 - Innovations in Practice (3)**

This course will provide exposure to current and developing areas of occupational therapy practice, technological advances, and healthcare system changes that impact the delivery of occupational therapy services. Students will demonstrate an understanding of direct and group intervention processes at the person, group, and population level. Students will be required to hold a stakeholder interview with a community leader, industry leader, occupational therapy advocate, or others who impact the delivery of occupational therapy services. Course instruction and learning opportunities will result in increased awareness of current practice across the lifespan, professional skill development, and advocacy in the field of OT. This course is a preparatory course for Capstone Development OTD 6554. Prerequisite: Successful completion of the previous semestser

Prerequisite: Successful completion of the previous semester.

**OTD 5191 - Occupation Based Intervention 1 (1)**

Lab experiences focus on transitioning from the evaluation phase to the intervention phase of the occupational therapy process. By using professional reasoning through the application of theoretical and process-based models of practice designed to deliver occupational therapy to behavioral health populations, the student will build competencies in developing and implementing an occupation-based intervention plan. By collaborating with the client/caregiver to select occupation-based goals, the student will determine the occupational therapy intervention approach, methods of service delivery, and intervention type, and consider the potential discharge needs or re-evaluation plans including the need to make recommendations or referrals to other resources or professionals. Prerequisite: Successful completion of the prior semester; Corequisite: OTD 5123

Prerequisite: Successful completion of the previous semester. Corequisite: Must be taken concurrently with OTD 5123.

**OTD 5202 - Dynamics of Occupation (2)**

An in-depth study of occupational therapy concepts and an introduction to the perspective of occupational science and the occupational perspective of health that highlights the transactional nature and relationship between aspects of human occupation and various contexts, including the therapeutic context. Students will analyze and evaluate how contextual factors support or hinder occupational engagement, through the introduction of four types of analyses used during the occupational therapy process: activity analysis, traditional task analyses, expanded task analysis, and performance analysis.

**OTD 5221 - CARE II (1)**

The second course in the Clinical Application and Reflection Experience (CARE) series will combine professional expectations established in CARE I and add skilled observation. Students will be expected to seek feedback from fieldwork instructor related to clinical performance, manage patient privacy and modesty, and well-being, and obtain patient history and/or occupational

profile. This fieldwork experience is designed for the purpose of synthesizing didactic learning with an experiential component that supports the development of knowledge, fieldwork problem-solving, and skills required for the delivery of occupational therapy. A combination of community-based, clinic-based, simulation, reflective group discussions, and faculty-led experiences will be utilized to stimulate critical reasoning and application of occupational therapy principles to occupational therapy practice with a pediatric population. Prerequisite: OTD 5111

Prerequisite: OTD 5111 and Successful completion of previous semester coursework.

**OTD 5222 - Principles of Documentation (2)**

An overview of essential professional and occupational-specific terminology to promote efficient and accurate documentation of occupational therapy services. This course will provide an overview of personal and professional responsibilities related to liability issues. Building off of professional responsibilities, students will also be exposed to the purpose of documentation as well as legal and ethical issues in documentation. Students will be introduced to reporting evaluation data, creating intervention plans, documenting progress notes, and establishing discharge summaries. An introduction to the consultative process with persons, groups, programs, organizations, or communities will be presented. The impact of occupational therapy services on the healthcare team and how to communicate using accepted terminology with members of the interprofessional team will be presented. Emphasis will be placed on electronic documentation systems, virtual therapeutic environments, and the delivery of occupational therapy services using telehealth technology.

Prerequisite: Acceptance into OTD Program.

**OTD 5223 - Innovations in Practice (3)**

This course will provide exposure to current and developing areas of occupational therapy practice, technological advances, and healthcare systems changes that impact the delivery of occupational therapy services. Students will demonstrate understanding of direct and group interventions processes at the person, group, and population level. Students will be required to hold a stakeholder interview with a community leader, industry leader, occupational therapy advocate, or others that impact the delivery of occupational therapy services. Course instruction and learning opportunities will result in increased awareness of current practice across the lifespan, professional skill development, and advocacy in the field of OT.

Prerequisite: Successful completion of the previous semester.

**OTD 5232 - Professional Development (2)**

Students will be introduced to professional behaviors and competencies necessary for becoming an informed occupational therapy practitioner. The Professional Development Evaluation Self-Assessment tool will be initiated to help students identify the characteristics necessary to become an entry-level practitioner. The course emphasizes self-awareness, self-assessment, communication issues, and the value of life-long learning. Students will be expected to articulate understanding of occupational therapists' role among the healthcare team, including requirements for credentialing. Students will experience ways to promote occupational therapy and develop basic skills for capstone development. Prerequisite: Successful completion of the previous semester

Prerequisite: Successful completion of the previous semester.

**OTD 5243 - Scholarly Inquiry & EBP I (3)**

An introduction to research methods and scholarly activities with emphasis on evidence-based practice, outcomes research, determining levels of evidence, and contributing to the advancement of the occupational therapy body of knowledge. Students will study the theoretical foundations of evidence-based practice and develop a framework to support sound clinical reasoning. Students will be expected to demonstrate the ability search, retrieve, and organize scientific evidence from sources of knowledge. Following an introduction to psychometrics and principles of measurement in healthcare, students will learn to critically evaluate current literature to inform clinical decisions. Prerequisite: Successful completion of the previous semester

Prerequisite: Successful completion of the previous semester.

**OTD 5251 - Occupation-Based Intervention 2 (1)**

Lab experiences focus on transitioning from the evaluation phase to the intervention phase of the occupational therapy process. By using professional reasoning through the application of theoretical and process-based models of practice designed to deliver occupational therapy to pediatric populations, the student will build competencies in developing and implementing an occupation-based intervention plan. By collaborating with the client to select occupation-based goals, the student will determine the occupational therapy intervention approach, methods of service delivery, and intervention type, and consider the potential discharge needs or re-evaluation plans including the need to make recommendations or referrals to other resources or professionals. Prerequisite: OTD 5191. Corequisite: OTD 5253

Prerequisite: Successful completion of the previous semester, OTD 5191. Corequisite: OTD 5253.

**OTD 5253 - OT Theory & Pediatrics (3)**

An overview of human development will be presented to allow students to understand implications for assessment and intervention. Students will explore the theoretical basis of pediatric evaluation, appropriate assessment methods, standardized and non-standardized assessment tools, interpretation of results, and documentation of findings. Interventions will be presented and carried over into OTD 5251. This course specifically includes instruction on methods for gathering information to construct an occupational profile which should include consideration of the roles that sociocultural, socioeconomic, and social determinants of health play in the pediatric client's overall health and ability to engage in the occupations of ADL's, IADL's, Health Management, Rest and Sleep, Education, Work, Play, Leisure, and Social Participation. Prerequisite: OTD 5123; Corequisite: OTD 5221 and OTD 5251

Prerequisite: OTD 5123 and successful completion. Corequisite: OTD 5251 and 5221.

**OTD 5322 - Applied Physiology I (2)**

This course assists students with bridging the gap between basic anatomy, physiology, and disease processes that affect the adult population. Students will be expected to complete pre-work assignments to prepare for review (1 hour lecture) and application of material (2-hour lab). Case studies will be used to guide students in the application of knowledge to clinical presentation. Course content will be reinforced through OTD 5353 and will assist students with appropriate selection of assessments and interventions with the adult population. Areas of concentration may include orthopedic injuries, acquired brain injuries, trauma, burns, neoplasms, and changes with immune system that impact occupational performance. Prerequisite: Successful completion of the previous semester; Corequisite: OTD 5353

Prerequisite: Successful completion of the previous semester. Corequisite: OTD 5353.

**OTD 5331 - CARE III (1)**

The third course in the Clinical Application and Reflection Experience (CARE) series builds off the skills demonstrated in the first two courses. Students will be expected to demonstrate an understanding of site-specific EMR and accompanying documentation strategies, select relevant information to document, practice site-specific examination or techniques, and develop a treatment plan to address limitations. This fieldwork experience is designed to synthesize didactic learning with an experiential component that supports the development of knowledge, fieldwork problem-solving, and skills required for the delivery of occupational therapy. A combination of community-based, clinic-based, simulation, reflective group discussions, and faculty-led experiences could be utilized to stimulate critical reasoning and application of occupational therapy principles. Prerequisite: OTD 5221

Prerequisite: OTD 5221. Corequisite: None.

**OTD 5332 - Practice Design and Simulation (2)**

Practice Design and Simulation builds off the foundational skills learned in OTD 5132. This course provides students with the opportunity to review records, plan, create, and document occupational therapy services in a simulated and live patient scenario. Collaboration with other graduate healthcare students will allow for application of the intervention planning and following intervention, a review of documentation to gain a deeper understanding of co-treatment. Through this interprofessional experience, students will be able to understand the implications for billing and reimbursement for individual

sessions as well as co-treatment. Students will be expected to accurately integrate medical and occupational therapy specific terminology into documentation samples. Students will demonstrate understanding of the continuum of care and discharge planning process across multiple practice settings. The course includes demonstrating understanding of the ethical issues in documentation. Prerequisites: OTD 5132

Prerequisite: OTD 5132.

**OTD 5333 - Movement & Occupational Analysis (3)**

Students will evaluate, measure, and study the structure and function of muscles and joints using the concepts of biomechanical analysis as they apply to occupational engagement to design intervention with consideration to client factors and context. Properties of muscles and muscle contraction, range of motion, strength, and joint structure, together with consideration of evidence-based best practices in the use of assistive devices, wheelchair management, wound care, bed mobility, and safe transfers will be introduced for addressing occupational dysfunction. The two-hour laboratory experience will be completed in the cadaver/ wet lab.

Prerequisite: Successful completion of the previous semester.

**OTD 5343 - Scholarly Inquiry and EBP II (3)**

Students study principles of experimental, qualitative, and survey research methods and the application of these methods to the field of occupational therapy. Emphasis is placed on the function of the research question, hypotheses, study design, sampling, study variables, measurement, reliability, validity, and statistics in the analysis and evaluation of research literature. In addition to descriptive statistics, students are introduced to linear regression, comparison of means, and categorical data analysis (chi-square and logistic regression). Statistics for comparison of results across studies will also be discussed (e.g., effect size, odds ratio). Prerequisites: OTD 5243

Prerequisite: OTD 5243.

**OTD 5351 - Occupation-Based Intervention 3 (1)**

Lab experiences focus on transitioning from the evaluation phase to the intervention phase of the occupational therapy process. By using professional reasoning through the application of theoretical and process-based models of practice designed to deliver occupational therapy to adult populations, the student will build competencies in developing and implementing an occupation-based intervention plan. By collaborating with the client to select occupation-based goals, the student will determine the occupational therapy intervention approach, methods of service delivery, and intervention type, and consider the potential discharge needs or re-evaluation plans including the need to make recommendations or referrals to other resources or professionals. Prerequisite: OTD 5251; Corequisite: OTD 5353

Prerequisite: OTD 5251. Corequisite: OTD 5353.

**OTD 5353 - OT Theory & Adults (3)**

An overview of the evaluation process in occupational therapy practice with adults. A focus on the theoretical basis of evaluation, selection of appropriate data-gathering methods, use of standardized and non-standardized assessment tools, interpretation of results, and documentation of evaluation findings. The course will specifically include instruction on methods for gathering information to construct an occupational profile which should include consideration of the roles that sociocultural, socioeconomic, and social determinants of health play in the client's overall health and ability to engage in the occupations of ADL's, IADL's, Health Management, Rest and Sleep, Education, Work, Play, Leisure, and Social Participation. Prerequisite: OTD 5253; Corequisites: OTD 5322 and 5351

Prerequisite: OTD 5253. Corequisite: OTD 5322 and 5351.

**OTD 5811 - Occupation-Based Intervention 3 (1)**

Lab experiences focus on transitioning from the evaluation phase to the intervention phase of the occupational therapy process. By using professional reasoning through the application of theoretical and process-based models of practice designed to deliver occupational therapy to adult populations, the student will build competencies in developing and implementing an occupation-

based intervention plan. By collaborating with the client to select occupation-based goals, the student will determine the occupational therapy intervention approach, methods of service delivery, and intervention type, and consider the potential discharge needs or re-evaluation plans including the need to make recommendations or referrals to other resources or professionals.  Corequisite: OTD 5803

Corequisite: OTD 5803.

**OTD 6423 - Neuroscience of Occupations (3)**

Study of the basic organization, structure, function, and pathology of the central, peripheral, and autonomic nervous systems that emphasizes an understanding of the impacts of sensory, motor, cognitive, psychological, emotional, and spiritual client factors as they relate to human engagement in occupation. Course content will build in depth and generalize to case studies from OTD 5322. The two hours of lab time will be spent in the cadaver/ wet lab.

Prerequisite: Successful completion of the previous semester.

**OTD 6433 - Leadership, Management, and Supervision (3)**

Students will explore leadership theories and management concepts relevant to the current healthcare trends, interdisciplinary teamwork, and impact on service delivery. Principles of supervision will be analyzed with an emphasis on collaboration with the Certified Occupational Therapy Assistant (COTA) and other non-OT personnel. Issues of interest for the professional such as the occupational therapist's role in emerging practice areas, national health disparities, occupational justice, and healthcare reform will be examined. Students will be expected to demonstrate competence with professional communication, collaboration with interprofessional graduate students, and professionalism. In this course, students will learn project management principles to generalize to Capstone Development (OTD 6554). Prerequisites: OTD 5232 and OTD 5332

Prerequisite: OTD 5232; OTD 5332. Corequisite: None.

**OTD 6441 - CARE IV (1)**

The Clinical Application and Reflection Experience (CARE) series is designed for the purpose of synthesizing didactic learning with an experiential component that supports the development of knowledge, fieldwork problem-solving, and skills required for the delivery of occupational therapy. Students will be expected to evaluate effectiveness of his/her communication and modify communication, value the socio-cultural, psychological and economical influences on patient and clients and respond accordingly, and design an intervention plan that is based on the best available evidence, clinical expertise, and patient preference. This fieldwork experience is designed for the purpose of synthesizing didactic learning with an experiential component that supports the development of knowledge, fieldwork problem-solving, and skills required for the delivery of occupational therapy. Students will be focusing on building professional skills related to standardized assessments and collaborating with the interprofessional team to report results. A combination of community-based, clinic-based, simulation, reflective group discussions, and faculty-led experiences will be utilized to stimulate critical reasoning and application of occupational therapy principles across the lifespan. Prerequisite: OTD 5331

Prerequisite: OTD 5331.

**OTD 6443 - Assistive Technology in OT (3)**

An exploration of technology and environmental intervention including assistive technology, electronic aids to daily living and communication, virtual environments, and seating, mobility, and positioning systems. Approaches and strategies used to increase, maintain, or improve the functional occupational performance of clients in their daily occupations will be addressed. Students will demonstrate the ability to design, fabricate, apply, fit, and teach the client to implement assistive technologies that support accessible contexts. This course will also guide how occupational therapists educate and train clients and caregivers on the use and maintenance of technology. Prerequisite: Successful completion of the previous semester

Prerequisite: Prerequisite: Successful completion of the previous semester. Corequisite: None.

**OTD 6522 - Applied Physiology II (2)**

This course assists students with bridging the gap between basic anatomy, physiology, and disease processes that affect the

older adult population. Students will be expected to complete pre-work assignments to prepare for review (1 hour lecture) and application of material (2-hour lab). Case studies will be used to guide students in the application of knowledge to clinical presentation. Course content will be reinforced through OTD 6553 and will assist students with appropriate selection of assessments and interventions with the older adult population. Areas of concentration may include stroke, cognitive impairments, degenerative diseases, fall related injuries, vascular changes with aging, and pulmonary changes. Prerequisite: OTD 5322; Corequisite: OTD 6553

Prerequisite: OTD 5322. Corequisite: OTD 6553.

**OTD 6532 - IPCP & Emerging Practice (2)**

Students will engage in immersive interdisciplinary experiences in the community, within educational settings, to explore occupational therapy's role within specialized areas of practice, or populations. Students will refine skills, employ clinical reasoning, and participate in reflective group discussions on health promotion, disease/disability prevention strategies, innovative program development, and epidemiological factors that impact public health and the welfare of populations. Students will be exposed to emerging practice areas through presentations, research, and faculty-led experiences. Prerequisite: OTD 6433

Prerequisite: OTD 6433.

**OTD 6543 - Scholarly Inquiry & EBP III (3)**

In this course students apply the concepts of evidence-based practice to answer a question relevant to clinical practice. Students work in groups with faculty mentors to identify a question, review the literature, and collect and analyze evidence to determine best practices and/or policies. The course will meet its outcomes through one of three mechanisms: (1) student research with a faculty mentor; (2) an evidence-based project; or (3) a case study. Weekly sessions will be led by the instructor(s) of record and the recitations will be mentored by an assigned OTD faculty member or key Capstone stakeholder. The weekly sessions will focus on the application of concepts from prior evidence-based practice courses and critical evaluation of the literature. Students will present their research findings at an interprofessional poster presentation at the end of the fall semester. Prerequisite: Successful completion of the previous semester and OTD 5343

Prerequisite: Successful completion of the previous semester and OTD 5343.

**OTD 6543 - Scholarly Inquiry & EBP III (3)**

In this course students apply the concepts of evidence-based practice to answer a question relevant to clinical practice. Students work in groups with faculty mentors to identify a question, review the literature, and collect and analyze evidence to determine best practices and/or policies. The course will meet its outcomes through one of three mechanisms: (1) student research with a faculty mentor; (2) an evidence-based project; or (3) a case study. Weekly sessions will be led by the instructor(s) of record and the recitations will be mentored by an assigned OTD faculty member or key Capstone stakeholder. The weekly sessions will focus on the application of concepts from prior evidence-based practice courses and critical evaluation of the literature. Students will present their research findings at an interprofessional poster presentation at the end of the fall semester. Prerequisite: Successful completion of the previous semester and OTD 5343

Prerequisite: Successful completion of the previous semester and OTD 5343.

**OTD 6551 - CARE V (1)**

The Clinical Application and Reflection Experience (CARE) series is designed for the purpose of synthesizing didactic learning with an experiential component that supports the development of knowledge, fieldwork problem-solving, and skills required for the delivery of occupational therapy. Students will be expected to work in teams with a fieldwork instructor to practice and refine skills, employ clinical problem-solving, participate in reflective group discussions, and assume professional roles in various clinical patient care settings. This fieldwork experience is designed for the purpose of synthesizing didactic learning with an experiential component that supports the development of knowledge, fieldwork problem-solving, and skills required for the delivery of occupational therapy. A combination of community-based, clinic-based, simulation, reflective group discussions, and faculty-led experiences will be utilized to stimulate critical reasoning and application of occupational therapy principles with the older adult population. Prerequisite: OTD 6441

Prerequisite: OTD 6441.

**OTD 6553 - OT Theory & Older Adults (3)**

An overview of the evaluation process in occupational therapy practice with older adults. Includes the theoretical basis of evaluation, selection of appropriate data-gathering methods, use of standardized and non-standardized assessment tools, interpretation of results, and documentation of evaluation findings. The course will specifically include instruction on methods for gathering information to construct an occupational profile which should include consideration of the roles that sociocultural, socioeconomic, and social determinants of health play in the client's overall health and ability to engage in the occupations of ADL's, IADL's, Health Management, Rest and Sleep, Education, Work, Play, Leisure, and Social Participation. Prerequisite: OTD 5353; Corequisites: OTD 6522 and OTD 6591

Prerequisite: OTD 5353. Corequisite: OTD 6522; OTD 6591.

**OTD 6554 - Capstone Development (4)**

This course will require students to build off the skills gained throughout the curriculum. The project plan will be approved by the Doctoral Capstone Coordinator, designated faculty member, as well as a key stakeholder for the project. The Capstone Project will include a literature review, a needs assessment, learning objectives/goals, and an evaluation plan. Student should be able to articulate how their project impacts OT practice and how it relates to licensure and state requirements. Students will be able to identify an applicable grant application that could benefit the outcome of their experience. The capstone project must reflect at least one of the following primary areas of focus which include Clinical Practice Skills, Program Development, or Leadership. Prerequisites: OTD 5332 and OTD 6433

Prerequisite: OTD 5332; OTD 6433.

**OTD 6591 - Occupation-Based Intervention 4 (1)**

Lab experiences focus on transitioning from the evaluation phase to the intervention phase of the occupational therapy process. By using professional reasoning through the application of theoretical and process-based models of practice designed to deliver occupational therapy to older adult populations, the student will build competencies in developing and implementing an occupation-based intervention plan. By collaborating with the client to select occupation-based goals, the student will determine the occupational therapy intervention approach, methods of service delivery, and intervention type, and consider the potential discharge needs or re-evaluation plans including the need to make recommendations or referrals to other resources or professionals. Prerequisite: OTD 5351; Corequisite: OTD 6553

Prerequisite: OTD 5351. Corequisite: OTD 6553.

**OTD 6644 - Level II Fieldwork A (14)**

The goal of this course is to prepare competent, entry-level, generalist occupational therapists through in-depth experiences that provide students the opportunity to integrate knowledge from previous coursework. Students will be responsible for delivering occupational therapy services to clients under the supervision of an experienced, certified occupational therapist and mentor. The focus is to refine skills, employ fieldwork problem-solving, assume professional roles, and apply purposeful and ethical occupation and/or research, administration, and management of occupational therapy services. Prerequisites: Successful completion of didactic  Level I Fieldwork

Prerequisite: Successful completion of didactic & Level I Fieldwork.

**OTD 6902 - Level I Fieldwork C (2)**

This clinical experience is designed for the purpose of synthesizing didactic learning with an experiential component that supports the development of knowledge, clinical problem-solving, and skills required for the delivery of occupational therapy. A combination of community-based, clinic-based, simulation, reflective group discussions, and faculty-led experiences will be utilized to stimulate critical reasoning and application of occupational therapy principles to occupational therapy practice with older adults.  Prerequisites: OTD 5912

Prerequisite: OTD 5912.

**OTD 7740 - Level II Fieldwork B (10)**

The goal of this course is to prepare competent, entry-level, generalist occupational therapists through in-depth experiences that provide students the opportunity to integrate knowledge from previous coursework. Students will be responsible for delivering occupational therapy services to clients under the supervision of an experienced, certified occupational therapist and mentor. The focus is to refine skills, employ clinical problem-solving, assume professional roles, and apply purposeful and ethical occupation and/or research, administration, and management of occupational therapy services. Prerequisites: OTD 6644

Prerequisite: OTD 6644.

**OTD 7841 - Doctoral Capstone Presentation (1)**

Following the implementation of the doctoral capstone project, students will submit a final written report to demonstrate synthesis and application of knowledge gained. Students will also formally disseminate the outcomes based on the nature of the individualized project to a professional audience. Dissemination methods include a professional poster presentation and may additionally consist of a press or journal article, manuscript, webinar, etc. Prerequisite: OTD 7740; Corequisite: OTD 7844

Prerequisite: OTD 7740. Corequisite: OTD7844.

**OTD 7842 - Doctoral Capstone Presentation (2)**

Following the implementation of the doctoral capstone project, students will submit a final written report to demonstrate synthesis and application of knowledge gained. Students will also formally disseminate the outcomes based on the nature of the individualized project to a professional audience. Dissemination methods include a professional poster presentation and may additionally consist of a press or journal article, manuscript, webinar, etc. Prerequisite: OTD 7740; Corequisite: OTD 7844

Prerequisite: OTD 7740. Corequisite: OTD 7844.

**OTD 7844 - Doctoral Capstone Experience (14)**

The goal of the Doctoral Capstone Experience (DCE) is to develop occupational therapists with advanced knowledge and skill beyond the generalist level in a focused area of practice. Students will participate in an in-depth experience in an area such as fieldwork practice, research, leadership, program and/or policy development, advocacy, education, or theory development. The DCE culminates in an individualized project that connects practice with scholarship by the implementation and evaluation of the doctoral capstone project which will be presented in OTD 7841. The student must document a minimum of 560 hours of participation in a mentored capstone experience. Prerequisites: OTD 7740; Corequisites: OTD 7841

Prerequisite: OTD 7740. Corequisite: OTD 7841.

# PAS-Physician Assistant Studies

**PAS 5001 - Clinical Genetics (1)**

This course will focus on the clinically relevant genetics and genomics necessary for clinical practice. This survey course covers introductory genetics, inheritable patterns disease, specific hereditary diseases and clinical applications of genetics/genomics. Prerequisite: Matriculation into the PA program.

Prerequisite: Matriculation into the PA program.

**PAS 5002 - Diagnostic Techniques - Laboratory Medicine (2)**

This course is one of a series of three lecture and lab courses in which students acquire and practice various diagnostic clinical skills. In this course, students will be introduced to the interpretation and application of common clinical laboratory tests.

Prerequisite: Matriculation into the PA program. Corequisite: None.

**PAS 5003 - Clinical Physiology (3)**

This lecture and lab course is a graduate level survey of clinically relevant human physiology. Prerequisite: Matriculation into

the PA program.

Prerequisite: Matriculation into the PA program.

**PAS 5004 - Clinical Anatomy (4)**

This lecture and lab course emphasize a clinical application in the study of human anatomy. The course incorporates a mixture of lectures, 3D computer animations, anatomical models, hands-on applications, discussion, and the examination of cadaveric specimens.

Prerequisite: Matriculation into the PA program. Corequisite: None.

**PAS 5012 - Clinical Skills I: Medical Documentation and Interviewing (2)**

This is the first in a series of four lecture and lab courses in which students learn to perform a health history, physical examination, and diagnostic and therapeutic procedures on patients across the lifespan. In this course, the emphasis will be on the art of communication in medicine, the medical interview, and the proper documentation of medical encounters.

Prerequisite: Matriculation into the PA Program. Corequisite: None.

**PAS 5014 - Clinical Physiology (4)**

This course is a graduate-level survey of clinically relevant human physiology and abnormal physiology associated with common clinical conditions, injuries, pathologies, and diagnostic / interventional procedures.

Prerequisite: Matriculation into the PA program. Corequisite: None.

**PAS 5022 - Physician Assistant Professional Practice (2)**

In this course, students learn about issues pertinent to the PA profession. The course covers the profession's history and future directions, roles and responsibilities, and organizations. Policies and laws that impact PA practice are discussed in this course. The course also includes an introduction to the psychosocial aspects of medical care and medical ethics.

Prerequisite: Matriculation into the PA Program. Corequisite: None.

**PAS 5052 - Clinical Application and Reflection Experience I (2)**

This is the first in a series of four courses where students work in teams to practice and refine skills, employ problem-solving, participate in reflective experiences, and assume professional roles. Students are expected to retain and apply knowledge from concurrent and previous coursework. Examples of experiences include simulation/standardized patients, interprofessional education opportunities, preclinical patient exposures, and case studies. Professional development areas include professional communication and behavior, conflict resolution, and stress management.

Prerequisite: Matriculation into the PA Program. Corequisite: None.

**PAS 5102 - Clinical Skills II: Physical Exam (2)**

This is the second in a series of four lecture and lab courses in which students learn to perform a health history, physical examination, and diagnostic and therapeutic procedures on patients across the lifespan. In this course, an emphasis will be placed on the performance of a complete (head-to-toe) physical examination. Prerequisite: PAS 5012

Prerequisite: PAS 5012. Corequisite: None.

**PAS 5110 - Clinical Medicine and Therapeutics I (10)**

This is the first in a series of three courses for the study of the diagnosis and management of common acute, emergent, rehabilitative, and chronic medical disorders across the lifespan. The relevant anatomy, physiology, and pathophysiology of disease states are discussed, followed by incidence/prevalence, associated risk factors, signs and symptoms, clinical findings, diagnostic criteria, diagnostic tests and procedures, pharmacologic and non-pharmacologic therapeutic options, prevention, patient education, follow-up care, course, and prognosis. This 3-series course series collectively covers disorders categorized

under the following organ systems: cardiovascular, dermatology, ophthalmology, EENT, endocrine, GI/Nutritional, GU, hematology, infectious disease, musculoskeletal/rheumatology, neurological, psychiatry/behavioral medicine, pulmonary, and reproductive.

Prerequisite: Matriculation into the PA program. Corequisite: None.

**PAS 5112 - Diagnostic Techniques - EKG (2)**

This course is one of a series of three courses in which students acquire and practice various diagnostic clinical skills. In this course the student will learn interpretation of electrocardiograms and some associated clinical syndromes and diagnoses as well as therapeutic interventions for common dysrhythmias and cardiac syndromes.

Prerequisite: Matriculation into the PA Program. Corequisite: None.

**PAS 5122 - Clinical Genetics (2)**

This course will focus on the clinically relevant genetics and genomics necessary for clinical practice. This survey course covers introductory genetics, inheritable patterns of disease, specific hereditary diseases, and clinical applications of genetics/genomics.

Prerequisite: Matriculation into the PA program. Corequisite: None.

**PAS 5152 - Clinical Application and Reflection Experience II (2)**

This is the second course in a series of four where students work in teams to practice and refine skills, employ problem-solving, participate in reflective experiences, and assume professional roles. Students are expected to retain and apply knowledge from concurrent and previous coursework. Examples of experiences include simulation/standardized patients, interprofessional education opportunities, preclinical patient exposures, and case studies. Professional development areas include communication and behavior, conflict resolution, and stress management. Prerequisite: PAS 5052

Prerequisite: PAS 5052. Corequisite: None.

**PAS 5161 - Clinical Pharmacology I (1)**

This course is the first in a series of three courses for the study of clinical pharmacology appropriate to the professional physician assistant role. The basic principles of pharmacology, pharmacodynamics and pharmacokinetics are discussed. This 3-series course collectively provides an introduction to the pharmacologic processes in the care and promotion of wellness across the lifespan, including the medications commonly used to treat human disorders, their classification, mechanisms of actions, indications, contraindications/cautions, formulations, routes of metabolism and excretion, adverse reactions, and drug interactions.

Prerequisite: Matriculation into the PA Program. Corequisite: None.

**PAS 5171 - Evidence Based Practice I (1)**

This course series will provide a foundational framework for understanding and applying evidence-based practice (EBP) in the health sciences, covering the steps in the EBP research process and strategies for implementing EBP in real world settings among diverse populations. In this first course in the series, students study the philosophical, theoretical, and ethical concepts of evidence-based research and learn how to frame, search, screen and select, retrieve, organize, synthesize, and survey the clinical evidence.

Prerequisite: Matriculation into the MPAS program. Corequisite: None.

**PAS 5205 - Clinical Medicine & Therapeutics II (5)**

This is the second in a series of three courses for the study of the diagnosis and management of common acute, emergent, rehabilitative, and chronic medical disorders across the lifespan. The relevant anatomy, physiology, and pathophysiology of disease states are discussed, followed by incidence/prevalence, associated risk factors, signs and symptoms, clinical findings, diagnostic criteria, diagnostic tests and procedures, pharmacologic and non-pharmacologic therapeutic options, prevention,

patient education, follow-up care, course, and prognosis. This 3-series course series collectively covers disorders categorized under the following organ systems: cardiovascular, dermatology, ophthalmology, EENT, endocrine, GI/Nutritional, GU, hematology, infectious disease, musculoskeletal, neurological, psychiatry/behavioral medicine, pulmonary, and reproductive. Prerequisite: PAS 5110.

Prerequisite: PAS 5110.

**PAS 5206 - Clinical Medicine and Therapeutics II (6)**

This is the second in a series of three courses for the study of the diagnosis and management of common acute, emergent, rehabilitative, and chronic medical disorders across the lifespan. The relevant anatomy, physiology, and pathophysiology of disease states are discussed, followed by incidence/prevalence, associated risk factors, signs and symptoms, clinical findings, diagnostic criteria, diagnostic tests and procedures, pharmacologic and non-pharmacologic therapeutic options, prevention, patient education, follow-up care, course, and prognosis. This 3-series course series collectively covers disorders categorized under the following organ systems: cardiovascular, dermatology, ophthalmology, EENT, endocrine, GI/Nutritional, GU, hematology, infectious disease, musculoskeletal, neurological, psychiatry/behavioral medicine, pulmonary, and reproductive. Prerequisite: PAS 5110

Prerequisite: PAS 5110 Clinical Medicine and Therapeutics I.

**PAS 5212 - Clinical Skills III - Special Populations (2)**

This is the third in a series of four lecture and lab courses in which students learn to perform a health history, physical examination, and diagnostic and therapeutic procedures on patients across the lifespan. In this course, an emphasis will be placed on the provision of medical care for prenatal, infant, children, adolescents, adults, and the elderly. In addition, students will receive instruction on the performance of male and female specialty exams and obstetrics. Prerequisite: PAS 5102

Prerequisite: PAS 5102. Corequisite: None.

**PAS 5213 - Diagnostic Techniques - Imaging (3)**

This course is one of a series of three lecture courses in which students acquire and practice various diagnostic clinical skills. This course will focus on diagnostic imaging (radiography, computer tomography, magnetic and resonance imaging, ultrasound, etc.).

Prerequisite: Matriculation into the PA Program. Corequisite: None.

**PAS 5252 - Clinical Application and Reflection Experience III (2)**

This is the third in a series of four courses where students work in teams to practice and refine skills, employ problem-solving, participate in reflective experiences, and assume professional roles. Students are expected to retain and apply knowledge from concurrent and previous coursework. Examples of experiences include simulation/standardized patients, interprofessional education opportunities, preclinical patient exposures, and case studies. Professional development areas include professional communication and behavior, conflict resolution, and stress management. Prerequisite: PAS 5152

Prerequisite: PAS 5152. Corequisite: None.

**PAS 5261 - Clinical Pharmacology II (1)**

This course is the second in a series of three courses for the study of clinical pharmacology appropriate to the professional physician assistant role. The basic principles of pharmacology, pharmacodynamics, and pharmacokinetics are applied to generate pharmacologic management plans for diseases/disorders based on current clinical practice guidelines and other evidence-based resources. The 3-series clinical pharmacology course collectively provides an introduction to the pharmacologic processes in the care and promotion of wellness across the lifespan, including the medications commonly used to treat human disorders, their classification, mechanisms of actions, indications, contraindications/cautions, formulations, routes of metabolism and excretion, adverse reactions, and drug interactions. Prerequisite: PAS 5161

Prerequisite: PAS 5161. Corequisite: None.

**PAS 5310 - Clinical Medicine and Therapeutics III (10)**

This is the third in a series of three courses for the study of the diagnosis and management of common acute, emergent, rehabilitative, and chronic medical disorders across the lifespan. The relevant anatomy, physiology, and pathophysiology of disease states will be discussed, followed by incidence/prevalence, associated risk factors, signs and symptoms, clinical findings, diagnostic criteria, diagnostic tests and procedures, pharmacologic and non-pharmacologic therapeutic options, prevention, patient education, follow-up care, course, and prognosis. This 3-series course series collectively covers disorders categorized under the following organ systems: cardiovascular, dermatology, ophthalmology, EENT, endocrine, GI/Nutritional, GU, hematology, infectious disease, musculoskeletal, neurological, psychiatry/behavioral medicine, pulmonary, and reproductive. Prerequisite: PAS 5206

Prerequisite: PAS 5206. Corequisite: None.

**PAS 5312 - Clinical Skills IV - Procedures (2)**

This is the fourth in a series of four lecture and lab courses where students acquire and demonstrate diagnostic and therapeutic procedures common in clinical and surgical practice for the PA profession. Additionally, students will be oriented to the operating room and become knowledgeable in the informed consent process and pre-operative, intra-operative, and post-operative care. They will also learn about documentation of care, coding, and billing. Prerequisite: PAS 5212

Prerequisite: PAS 5212. Corequisite: None.

**PAS 5315 - Clinical Skills IV - Procedures (5)**

This is the fourth of a series of four lecture and lab courses in which students acquire and practice various diagnostic and therapeutic clinical skills, such as performance of health histories and physical exams, interpretation of laboratory, electrocardiographic, and imaging studies, the performance and interpretation of diagnostic and therapeutic procedures, and training in basic and advanced cardiac life support. In this course, the emphasis is on performance and interpretation of common diagnostic and therapeutic procedures including an orientation to the operating room, completion of advanced cardiac life support training, as well as the continuation of specialty-focused medical interviews and physical examinations across the lifespan from pediatrics to geriatrics, including the unique healthcare needs for women, diverse patient populations, and patients with disabilities. Prerequisite: PAS 5212 and PAS 5213

Prerequisite: PAS 5212 and PAS 5213.

**PAS 5352 - Clinical Application and Reflection Experience IV (2)**

This is the final course in a series of four where students work in teams to practice and refine skills, employ problem-solving, participate in reflective experiences, and assume professional roles. Students are expected to retain and apply knowledge from concurrent and previous coursework. Examples of experiences include simulation/standardized patients, interprofessional education opportunities, preclinical patient exposures, and case studies. Professional development areas include communication and behavior, conflict resolution, and stress management. Prerequisite: PAS 5252

Prerequisite: PAS 5252. Corequisite: None.

**PAS 5361 - Clinical Pharmacology III (1)**

This course is the third in a series of three courses for the study of clinical pharmacology appropriate to the professional physician assistant role. The basic principles of pharmacology, pharmacodynamics and pharmacokinetics are applied to generate pharmacologic management plans for the diseases/disorders based upon current clinical practice guidelines and other evidence-based resources. The 3-series Clinical Pharmacology Course collectively provides an introduction to the pharmacologic processes in the care and promotion of wellness across the lifespan, including the medications commonly used to treat human disorders, their classification, mechanisms of actions, indications, contraindications/cautions, formulations, routes of metabolism and excretion, adverse reactions, and drug interactions. Prerequisite: PAS 5261

Prerequisite: PAS 5261. Corequisite: None.

**PAS 5371 - Evidence Based Practice II (1)**

This course series will provide a foundational framework for understanding and applying evidence-based practice (EBP) in the health sciences, covering the steps in the EBP research process and strategies for implementing EBP in real world settings. In this second course in the series, students expand on previous knowledge of research methodologies and the application of these methods to the practice of medicine. Students critically appraise the validity, importance, and applicability of research studies for use in clinical decision-making and evidence-based practice among diverse populations. Some of the major topics include research ethics, study designs, sampling methods, design validity, descriptive and inferential statistics, selecting the appropriate statistical test, and hypothesis testing. Prerequisite: PAS 5171

Prerequisite: PAS 5171. Corequisite: None.

**PAS 6015 - Clinical Practicum I (5)**

In this clinical practicum, students are assigned into a clinical rotation in a variety of approved clinical settings. The program reserves the right to assign rotations or supplemental activities to ensure that students meet all experiential phase program requirements. There are seven program required rotations with opportunities for elective rotations. Required clinical rotations are experiences in Family Medicine, Internal Medicine, Emergency Medicine, Surgery, Women's Health, Pediatrics, and Behavioral Health. The student will have opportunities to explore elective rotation experiences depending upon preceptor availability. The program must ensure that students meet program requirements for the clinical phase, and, as such, reserves the right to assign rotations/supplemental activities to be sure requirements are met. Prerequisite: Successful completion of all didactic phase courses

Prerequisite: Successful completion of all didactic phase courses. Corequisite: None.

**PAS 6025 - Clinical Practicum II (5)**

In this clinical practicum, students are assigned into clinical rotations in a variety of approved clinical settings. There are seven program required rotations with opportunities for elective rotations. Required clinical rotations are experiences in Family Medicine, Internal Medicine, Emergency Medicine, Surgery, Women's Health, Pediatrics, and Behavioral Health. The program must ensure that students meet program requirements for the clinical phase, and, as such, reserves the right to assign rotations/supplemental activities to be sure requirements are met. The student will have opportunities to explore elective rotation experiences based on preceptor availability and student's schedule. Prerequisite: Successful completion of all didactic phase courses.

Prerequisite: Successful completion of all didactic phase courses. Corequisite: None.

**PAS 6035 - Clinical Practicum III (5)**

In this clinical practicum, students are assigned into clinical rotations in a variety of approved clinical settings. There are seven program required rotations with opportunities for elective rotations. Required clinical rotations are experiences in Family Medicine, Internal Medicine, Emergency Medicine, Surgery, Women's Health, Pediatrics, and Behavioral Health. The program must ensure that students meet program requirements for the clinical phase, and, as such, reserves the right to assign rotations/supplemental activities to be sure requirements are met. The student will have opportunities to explore elective rotation experiences based on preceptor availability and student's schedule. Prerequisite: Successful completion of all didactic phase courses.

Prerequisite: Successful completion of all didactic phase courses. Corequisite: None.

**PAS 6045 - Clinical Practicum IV (5)**

In this clinical practicum, students are assigned into clinical rotations in a variety of approved clinical settings. There are seven

program required rotations with opportunities for elective rotations. Required clinical rotations are experiences in Family Medicine, Internal Medicine, Emergency Medicine, Surgery, Women's Health, Pediatrics, and Behavioral Health. The program must ensure that students meet program requirements for the clinical phase, and, as such, reserves the right to assign rotations/supplemental activities to be sure requirements are met. The student will have opportunities to explore elective rotation experiences based on preceptor availability and student's schedule. Prerequisite: Successful completion of all didactic phase courses.

Prerequisite: Successful completion of all didactic phase courses. Corequisite: None.

**PAS 6055 - Clinical Practicum V (5)**

In this clinical practicum, students are assigned into clinical rotations in a variety of approved clinical settings. There are seven program required rotations with opportunities for elective rotations. Required clinical rotations are experiences in Family Medicine, Internal Medicine, Emergency Medicine, Surgery, Women's Health, Pediatrics, and Behavioral Health. The program must ensure that students meet program requirements for the clinical phase, and, as such, reserves the right to assign rotations/supplemental activities to be sure requirements are met. The student will have opportunities to explore elective rotation experiences based on preceptor availability and student's schedule. Prerequisite: Successful completion of all didactic phase courses.

Prerequisite: Successful completion of all didactic phase courses. Corequisite: None.

**PAS 6065 - Clinical Practicum VI (5)**

In this clinical practicum, students are assigned into clinical rotations in a variety of approved clinical settings. There are seven program required rotations with opportunities for elective rotations. Required clinical rotations are experiences in Family Medicine, Internal Medicine, Emergency Medicine, Surgery, Women's Health, Pediatrics, and Behavioral Health. The program must ensure that students meet program requirements for the clinical phase, and, as such, reserves the right to assign rotations/supplemental activities to be sure requirements are met. The student will have opportunities to explore elective rotation experiences based on preceptor availability and student's schedule. Prerequisite: Successful completion of all didactic phase courses.

Prerequisite: Successful completion of all didactic phase courses. Corequisite: None.

**PAS 6075 - Clinical Practicum VII (5)**

In this clinical practicum, students are assigned into clinical rotations in a variety of approved clinical settings. There are seven program required rotations with opportunities for elective rotations. Required clinical rotations are experiences in Family Medicine, Internal Medicine, Emergency Medicine, Surgery, Women's Health, Pediatrics, and Behavioral Health. The program must ensure that students meet program requirements for the clinical phase, and, as such, reserves the right to assign rotations/supplemental activities to be sure requirements are met. The student will have opportunities to explore elective rotation experiences based on preceptor availability and student's schedule. Prerequisite: Successful completion of all didactic phase courses.

Prerequisite: Successful completion of all didactic phase courses. Corequisite: None.

**PAS 6085 - Clinical Practicum VIII (5)**

In this clinical practicum, students are assigned into clinical rotations in a variety of approved clinical settings. There are seven program required rotations with opportunities for elective rotations. Required clinical rotations are experiences in Family Medicine, Internal Medicine, Emergency Medicine, Surgery, Women's Health, Pediatrics, and Behavioral Health. The program must ensure that students meet program requirements for the clinical phase, and, as such, reserves the right to assign rotations/supplemental activities to be sure requirements are met. The student will have opportunities to explore elective rotation experiences based on preceptor availability and student's schedule. Prerequisite: Successful completion of all didactic phase courses.

Prerequisite: Successful completion of all didactic phase courses. Corequisite: None.

**PAS 6095 - Clinical Practicum IX (5)**

In this clinical practicum, students are assigned into clinical rotations in a variety of approved clinical settings. There are seven program required rotations with opportunities for elective rotations. Required clinical rotations are experiences in Family Medicine, Internal Medicine, Emergency Medicine, Surgery, Women's Health, Pediatrics, and Behavioral Health. The program must ensure that students meet program requirements for the clinical phase, and, as such, reserves the right to assign rotations/supplemental activities to be sure requirements are met. The student will have opportunities to explore elective rotation experiences based on preceptor availability and student's schedule. Prerequisite: Successful completion of all didactic phase courses.

Prerequisite: Successful completion of all didactic phase courses. Corequisite: None.

**PAS 6141 - Senior Seminar I (1)**

This is the first of three Senior Seminar courses where students will further critique a wide variety of topics pertinent to medical practice, including: healthcare policy and systems issues, ethical and medicolegal aspects of clinical practice, reimbursement issues, patient safety and error reduction measures, and public health issues. Prerequisite: Successful completion of all didactic phase courses.

Prerequisite: Successful completion of all didactic phase courses. Corequisite: None.

**PAS 6171 - Graduate Project I (1)**

The first course in the series of three is designed to build upon the previous Evidence Based Practice courses and provide students with experience in planning and implementing a primary or secondary research project. Over the series of the Graduate Project courses, students actively participate in the research process by working individually or in small groups to identify a research problem or gap, frame an answerable question, and locate research studies relevant to clinical questions. Prerequisite: Successful completion of the program's didactic curriculum.

Prerequisite: Successful completion of the program's didactic curriculum. Corequisite: None.

**PAS 6241 - Senior Seminar 2 (1)**

This is the second of three Senior Seminar courses where students will critically think and consider healthcare policy and systems issues, medicolegal aspects of clinical practice, reimbursement issues, PA employment issues, patient safety and error reduction measures, and public health issues. Prerequisite: PAS 6141

Prerequisite: PAS 6141. Corequisite: None.

**PAS 6271 - Graduate Project 2 (1)**

The second course in the series is designed to build upon the previous Graduate Project course and provide students with experience implementing a primary or secondary research project. Over the series of the Graduate Project courses, students actively participate in the research process by working individually or in small groups to apply methodologies and critically scrutinize the results of a study. Those conducting primary research must complete the application for and receive IRB approval as needed and finish data collection. Prerequisite: PAS 6171

Prerequisite: PAS 6171. Corequisite: None.

**PAS 6341 - Senior Seminar 3 (1)**

This is the last of three Senior Seminar courses where students prepare for licensure, certification, and transition into professional PA practice. Prerequisite: PAS 6241

Prerequisite: PAS 6241. Corequisite: None.

**PAS 6371 - Graduate Project 3 (1)**

The final course in the series is designed to build upon the previous Graduate Project courses and provide students with experience in implementing a primary or secondary research project. Students will present findings and conclusions of their graduate project. The course concludes with a final submission and presentation of the project. Prerequisite: PAS 6271

Prerequisite: PAS 6271. Corequisite: None.

# PET-Plastics Engineering Tech

**PET 101 - Introduction to Plastics Engineering Technology (1)**

This course is required for all freshman engineering technology students. Its purpose is to improve student success, to make the college experience more relevant to career goals, and to help students obtain as much assistance from the university as possible while working toward their degree. The course will cover community building, academic goals, effective learning methods, university orientation, and personal and professional development.

**PET 113 - Plastics Product Manufacturing Processes (3)**

An introduction of the physical and mechanical properties of polymers, Polymers and production processes are quantitatively discussed in relation to modern industrial use. Processes include injection molding, vacuum forming, blow molding, extrusion, and testing methods applied to various polymeric materials.

**PET 223 - Polymer Structures, Properties & Applications (3)**

A study of the structure and properties of plastics materials. Mechanical properties are emphasized, electrical properties, thermal properties, and environmental interactions are addressed as they apply to the design of products for the plastics industry.

**PET 224 - Plastics Processing & Testing (4)**

This course introduces the procedures used in evaluating plastics materials, test samples, and molded parts and the standard testing methods used for evaluation of plastics materials, in particular ASTM and ISO. Interpretation of testing results with respect to raw materials selection, processing parameters, and part design considerations as well as the basic quality control and quality assurance techniques related to plastic testing will also be covered. Corequisite: PET 223 or equivalent polymer science course.

Corequisite: PET 223 or equivalent polymer science course.

**PET 233 - Introduction to Injection Molding (3)**

An introduction to injection molding and specifics related to this industrial process. Hands-on operation and setup of injection

molding machines, and materials used with them, will be specifically covered in order to provide a solid engineering process foundation to assist in developing a manufacturable product design for this process. Prerequisite: PET 113

Prerequisite: PET 113.

**PET 323 - Plastics Product Design (3)**

This course introduces the concepts of part design beginning with defining the customer and end-use requirements and moving through the entire design cycle and product application. The following areas are focused on: Material selection, prototyping and solid modeling, product drawing, review of basic design rules, form, fit and function in product application, part quality, relationship of tool design to part design, advanced tooling concepts, part costing and design to cost, end-use factors, and mechanical design with plastics will also be covered. Prerequisite: PET 223 or equivalent polymer science course; ETD 173 or EGR 143

Prerequisite: PET 223 or equivalent polymer science course; ETD 173 or EGR 143.

**PET 333 - Plastics Mold Engineering & Design (3)**

This course introduces the concepts of mold design and details involved in the creation of single and multiple cavity plastic injection molds and products using solid modeling software. Analysis of mold cavity fill, gate location(s)-size, runner size, and balance will be evaluated with computer aided mold fill programs. Instruction on the theory, application and practices of: plastic materials, forming and molding methods/machines, mold: bases, venting, cooling, ejectors, materials, heat treatments, fabrication, and finishing practices will also be covered. Prerequisites: PET 223 or equivalent polymer science course; ETD 173 or EGR 143; and ETD 433

Prerequisite: PET 223 or equivalent polymer science course; ETD 173 or EGR 143; and ETD 433.

**PET 353 - Thermodynamics & Heat Transfer for Engineering Technology (3)**

This course explores the basic properties of substances and ideal gasses through the use of tables and an overview of thermodynamic concepts of systems, control volumes, heat, work, and internal energy. The introductory study of heat transfer analysis and the primary modes of heat transfer: conduction, convection, and radiation will also be covered. Prerequisite: ETD 263 and PH 164 or equivalent

Prerequisite: ETD 263 and PH 164 or equivalent.

**PET 413 - Design for Additive Manufacturing (3)**

An advanced course that presents the various additive manufacturing processes and describes their value to current industry. Additive manufacturing equipment will be utilized to create products designed with 3D modeling software. Prerequisite: ETD 263

Prerequisite: ETD 263.

# PHL-Philosophy

**PHL 203 - Introduction To Philosophy (3)**

A study of the perennial problems of philosophy, such as the nature of knowledge, the role of the self, the existence of God, and the function of science. The contributions of the great thinkers of history to these problems are presented so that the student may find aid in forming his or her own philosophy.

**PHL 213 - Theories & Philosophies of Social Innovation (3)**

Students are introduced to the altruistic and philanthropic drivers of social innovation, specifically focusing on how the desire to accrue value for society is becoming more influential than profit motive. The course asks students to examine (through a number of lenses) the emergence of the humanistic element in what have traditionally been capitalistic and technological fields. (Same as SI 213)

Crosslisted as: SI 213.

**PHL 251 - Ancient Greece from the Persian Through Peloponnesian Wars (1)**

An examination of the culture of Athens and Sparta during the 5th century B.C., concentrating on the Persian and Peloponnesian wars and their lasting effects on Western Civilization. (Same as HIS 251)

Crosslisted as: HIS 251.

**PHL 313 - Ethics (3)**

A study of ethical language, methods of justifying ethical decisions, and types of ethical value systems, with emphasis on practical applications in terms of personal and social morality. Prerequisite: Junior standing or permission of instructor

Prerequisite: Junior standing or permission of instructor.

**PHL 323 - Philosophy of Religion (3)**

An inquiry into the nature of religious experience, activity and belief. An examination of the concepts of God, freedom, and immortality as well as the relationship of religious knowledge to artistic and scientific knowledge. Prerequisite: Junior standing or permission of instructor

Prerequisite: Junior standing or permission of instructor.

**PHL 333 - Art, Society & Technology (3)**

An interdisciplinary effort to place modern technology within a social, cultural, and historical context. (Same as SOC 333) Prerequisite: ENG 113 or ENG 133

Prerequisite: ENG 133. Crosslisted as: SOC 333.

**PHL 343 - Logic (3)**

An examination of the function of language and the nature of meanings. Valid and invalid reasoning, deductive and inductive methods. Particular emphasis will be given to the application of formal techniques to the evaluation of arguments in everyday settings. The course is argument and language oriented. Prerequisite: Junior standing or permission of instructor

Prerequisite: Junior standing or permission of instructor.

**PHL 353 - Ethical Issues in Medical Care (3)**

Ethical challenges routinely confront healthcare administrators and medical providers. This class will investigate medical system ethical issues which arise in the administration of medical treatment. Both business related and clinical issues will be addressed in the course.

# PH-Physics

**PH 104 - Physical Science (4)**

A development of basic concepts and theories in the physical sciences and physics. Conceptual view of mechanics, thermodynamics, sound waves, electricity, magnetism, and optics

Corequisite: Lab Required.

**PH 154 - College Physics I (4)**

An algebra-based introduction to the concepts and application of Newton's Law, linear and rotational motion, work, energy, and momentum, solids and fluids, and heat. Experimental investigation of selected topics. Lab required. Prerequisites: MA 113 and MA 123

Prerequisite: MA 113 and MA 123. Corequisite: Lab Required.

**PH 164 - College Physics II (4)**

An algebra-based introduction to the concepts and application of vibrations, waves and sound, Coulomb's Law, capacitance, DC electric circuits, magnetism, electromagnetic induction, optics and optical instruments. Experimental investigation of selected topics. Lab required. Prerequisite: PH 154

Prerequisite: PH 154. Corequisite: Lab Required.

**PH 224 - University Physics I (4)**

A calculus-based introduction to topics including measurement, kinematics and dynamics of translational motion, kinematics and dynamics of rotational motion, momentum, work, mechanical energy, power, statics, properties of solids, and thermodynamics. Experimental investigation of selected topics. Lab required. Prerequisite: MA 134

Prerequisite: MA 134. Corequisite: Lab Required.

**PH 224H - Honors University Physics I (4)**

Topics covered include measurement, kinematics and dynamics of translational motion, kinematics and dynamics of rotational motion, momentum, work, mechanical energy, power, statics, properties of solids, and thermodynamics. Emphasis is on collaborative learning and inquiry as opposed to traditional lecture. Assignments include additional analysis, research methods. Students complete a research project. Experimental investigation of selected topics. Prerequisites: MA 134 and admission to the Honors Program or permission of the instructor.

Prerequisite: MA 134 and admission to the Honors Program or permission of the instructor. Corequisite: Lab Required.

**PH 234 - University Physics II (4)**

A calculus-based introduction to topics including oscillatory motion, wave motion, electrostatics, DC circuits, magnetostatics, electromagnetism, and optics. Experimental investigation of selected topics. Prerequisites: MA 164 and PH 224

Prerequisite: MA 164 and PH 224. Corequisite: Lab Required.

**PH 234H - Honors University Physics II (4)**

Topics covered include oscillatory motion, wave motion, electrostatics, DC and AC circuits, magnetostatics, electromagnetism, and optics. Emphasis is on collaborative learning and inquiry as opposed to traditional lecture. Assignments include additional analysis, research methods. Students complete a research project. Experimental investigation of selected topics. Prerequisites: PH 224, MA 164 and admission to the Honors Program or permission of the instructor.

Prerequisite: PH 224, MA 164 and admission to the Honors Program or permission of the instructor. . Corequisite: Lab Required.

**PH 303 - Introduction to Modern Physics (3)**

Introduction to contemporary atomic and nuclear physics: special theory of relativity, particle properties of waves, wave properties of particles, atomic structure, first ideas of quantum mechanics. Prerequisites: MA 233, PH 234

Prerequisite: MA 233 and PH 234.

**PH 323 - Electromagnetism (3)**

A study of electrostatics, special techniques for calculating potentials, electrostatic fields in matter, magneto static fields in matter, and Maxwell's equations. Prerequisites: MA 233, PH 224, PH 234

Prerequisite: MA 233, PH 224, PH 234.

**PH 333 - Mechanics (3)**

The topics will be chosen based on the students' backgrounds from the following: fundamental laws of mechanics of particles and rigid body including vibrations and Lagrangian mechanics. Prerequisites: MA 233, PH 234

Prerequisite: MA 233 and PH 234.

**PH 343 - Special Topics in Physics (3)**

Emphasis on physics applications from the following topics: partial differential equations of mathematical physics. Orthogonal functions. Fourier series. Prerequisites: MA 233, PH 234

Prerequisite: MA 233 and PH 234.

**PH 353 - Thermal and Statistical Physics (3)**

Introduction to thermal and statistical physics. Apply thermodynamic principles to thermodynamic systems to describe and predict their behavior. Topics include thermal equilibrium, laws of thermodynamics, statistical mechanics. Prerequisite: PH 234

Prerequisite: PH 234 University Physics II.

**PH 4001 - Special Topics in Physics (1)**

Selected fields of physics chosen for their mathematical, philosophical or technological interest. May be repeated with the approval of the Department Chair for a maximum of 6 credit hours. Prerequisite: Permission of Department Chair

Prerequisite: Permission of Department Chair.

**PH 4002 - Special Topics in Physics (2)**

Selected fields of physics chosen for their mathematical, philosophical or technological interest. May be repeated with the approval of the Department Chair for a maximum of 6 credit hours. Prerequisite: Permission of Department Chair

Prerequisite: Permission of Department Chair.

**PH 4003 - Special Topics in Physics (3)**

Selected fields of physics chosen for their mathematical, philosophical or technological interest. May be repeated with the approval of the Department Chair for a maximum of 6 credit hours. Prerequisite: Permission of Department Chair

Prerequisite: Permission of Department Chair.

**PH 4004 - Special Topics in Physics (4)**

Selected fields of physics chosen for their mathematical, philosophical or technological interest. May be repeated with the approval of the Department Chair for a maximum of 6 credit hours. Prerequisite: Permission of Department Chair

Prerequisite: Permission of Department Chair.

**PH 4005 - Special Topics in Physics (5)**

Selected fields of physics chosen for their mathematical, philosophical or technological interest. May be repeated with the approval of the Department Chair for a maximum of 6 credit hours. Prerequisite: Permission of Department Chair

Prerequisite: Permission of Department Chair.

**PH 4006 - Special Topics in Physics (6)**

Selected fields of physics chosen for their mathematical, philosophical or technological interest. May be repeated with the approval of the Department Chair for a maximum of 6 credit hours. Prerequisite: Permission of Department Chair

Prerequisite: Permission of Department Chair.

# PL-Pre-legal

**PL 4003 - Legal Capstone Experience (3)**

The legal capstone experience will provide the opportunity to utilize the skills and knowledge the student has attained in their previous coursework in a concerted effort to prepare for and gain law school admission. Prerequisite: Junior standing or permission of instructor

Prerequisite: Junior standing or permission of instructor.

# POLS-Political Science

**POLS 113 - Introduction to Government (3)**

An examination of the origins and operations of the national political machinery; the development, functions and philosophy of political parties; the problems and tasks of leading governmental agencies.

**POLS 313 - Comparative Governments (3)**

A comparison of the systems, philosophies and functions of the governments of England, France, the United States, Germany and the countries of the former Soviet Union. Prerequisite: POLS 113

Prerequisite: POLS 113.

**POLS 323 - The Contemporary World (3)**

An analysis of current global issues from a historical perspective with an emphasis on developing an awareness of cultural diversity and an understanding of the role of international governmental and nongovernmental organizations. (Same as HIS 323) Prerequisites: POLS 113 or HIS 113

Prerequisite: POLS 113 or HIS 113. Crosslisted as: HIS 323.

**POLS 333 - State & Local Government (3)**

The general relationship between the states and the federal government; organization, functions, and divisions of authority between the executive, legislative and judicial. The functions, powers, and forms of county and municipal governments. Prerequisite: POLS 113

Prerequisite: POLS 113.

**POLS 343 - American Political Thought (3)**

A survey and analysis of significant political ideas from colonial times to present. Some of the ideas discussed in the survey include the philosophies of liberalism, conservatism, and pragmatism, as well as the political thinking of such men as Alexander Hamilton, Thomas Jefferson, John C. Calhoun, Henry Thoreau, Herbert Spencer and Lester Ward. (Same as HIS 343) Prerequisite: POLS 113

Prerequisite: POLS 113. Crosslisted as: HIS 343.

**POLS 363 - United States Foreign Policy (3)**

A history of United States involvement in world affairs from the War for Independence to the present; the close relationship between the foreign policy and domestic concerns is emphasized; an analysis of the policy-making bureaucracy. (Same as HIS 363) Prerequisites: HIS 113

Prerequisite: HIS 113. Crosslisted as: HIS 363.

**POLS 373 - Political Psychology (3)**

An examination of the role of group dynamics and personality variables in contemporary political issues, including leadership and power, political attitudes, current social movements, conflict resolution, coalition formation, cross-cultural comparison of political attitudes and other issues. (Same as PSY 373) Prerequisite: PSY 113 or POLS 113

Prerequisite: PSY 113 or POLS 113. Crosslisted as: PSY 373.

**POLS 403 - American Constitutional Development (3)**

A study of the historical and judicial developments of the Constitution of the United States by analyzing court decisions and the philosophies of the justices of the Supreme Court. Emphasis on the court's role in the development of national economic policy, with a focus on the court's position on civil rights and liberties, political freedom and social equality. (Same as HIS 403) Prerequisites: POLS 113

Prerequisite: POLS 113. Crosslisted as: HIS 403.

**POLS 423 - The United States as a World Power (3)**

A study of social, economic, intellectual, and political developments within the United States from approximately 1939 to the present. Emphasis is placed on relating America's developments to its role in international affairs. (Same as HIS 423) Prerequisite: POLS 113

Prerequisite: POLS 113 . Crosslisted as: HIS 423.

# PSY-Psychology

**PSY 113 - Principles of Psychology (3)**

Introduction to the scientific study of human and animal behavior. Course covers all of the major areas within psychology, including development, learning, intelligence, personality, attitudes, altered states of consciousness, abnormal behavior, and psychotherapy.

**PSY 113H - Honors Principles pf Psychology (3)**

Introduction to the scientific study of human and animal behavior. Course covers all of the major areas within psychology, including development, learning, intelligence, personality, attitudes, altered states of consciousness, abnormal behavior, and psychotherapy. The course will involve more in-depth analysis of selected topics as well as more classroom activities than usually covered. Prerequisite: Admission into the Honors Program or permission of the instructor

Prerequisite: Admission into the Honors Program or permission of the instructor.

**PSY 223 - Life Span Developmental Psychology (3)**

An investigation into the developmental stages within the entire lifespan of a human being, from birth through adult development and old age, with emphasis on the origin of personality and factors related to intellectual growth. Prerequisite: PSY 113

Prerequisite: PSY 113.

**PSY 303 - Research Methods in Psychology (3)**

An introduction to research methods employed in psychology, with special emphasis on experimental design. Topics include between and within-subjects designs, quasi-experimental designs, as well as research ethics and procedures for controlling extraneous variables. Prerequisite: PSY 113

Prerequisite: PSY 113.

**PSY 313 - Topics in Psychology (3)**

Survey, in detail, of one of the major areas of study within psychology. The course changes each semester with the specific topic of study announced in the class schedule. Prerequisite: PSY 113

Prerequisite: PSY 113.

**PSY 323 - Abnormal Psychology (3)**

Survey of abnormal psychology, including such topics as clinical assessment, anxiety disorders, schizophrenia, personality disorders, age-related problems, depression, sexual dysfunctions, psychotherapy, and related legal and ethical questions arising within clinical psychology. Prerequisite: PSY 113

Prerequisite: PSY 113.

**PSY 333 - Psychology of Personality (3)**

An introductory survey of problems, methods, and theories; personality development and motivation, with emphasis on the normal contemporary theories of adjustment and idiodynamics. Prerequisite: PSY 113

Prerequisite: PSY 113.

**PSY 343 - Social Psychology (3)**

An introduction to the measurement and principles of human interaction and group behavior including attitude change, prejudice, attraction, love, altruism, aggression, conformity, group dynamics, crowding, and other current social issues. (Same as SOC 343) Prerequisite: PSY 113

Prerequisite: PSY 113. Crosslisted as: SOC 343.

**PSY 353 - Child & Adolescent Psychology (3)**

An investigation into the development stages within the life of a human being, from birth through adolescence, with emphasis on the origin of personality and factors related to intellectual growth. Prerequisite: PSY 113

Prerequisite: PSY 113.

**PSY 363 - Human Behavior & Counseling (3)**

Examines the theory and practice of counseling with a corporate of social service setting Exposure to a variety of therapeutic techniques. Experience first-hand the complexities of the human mind through a case-study approach. Direct versus indirect forms of interventions are explored. (Same as SOC 363) Prerequisite: PSY 113

Prerequisite: PSY 113. Crosslisted as: SOC 363.

**PSY 373 - Political Psychology (3)**

An examination of the role of group dynamics and personality variables in contemporary political issues, including leadership and power, political attitudes, current social movements, conflict resolution, coalition formation, cross-cultural comparisons of political attitudes, and other issues. (Same as POLS 373) Prerequisites: POLS 113 or PSY 113

Prerequisite: POLS 113 or PSY 113. Crosslisted as: POLS 373.

**PSY 383 - Forensic Psychology (3)**

A pragmatic review of the psychological and sociological theories and practices which seek to evaluate and analyze deviant human behavior and environments which precipitate criminal conduct. An introduction into the profiling and prediction of criminals and criminal behavior. Prerequisite: PSY 113

Prerequisite: PSY 113.

**PSY 3013 - Health Psychology (3)**

Health Psychology is a course to examine how biological, psychological and social factors interact and affect the efforts individuals make in preventing illness and promoting good health. How individuals can effectively cope with and reduce stress while also looking at the role that stress has on illness. Prerequisite: PSY 113

Prerequisite: PSY 113.

**PSY 3023 - Cross-Cultural Psychology (3)**

This course will examine a variety of content about culture and psychology from theory to application, research, methodology, critical thinking, cognition and behavioral development within the field. Throughout the semester, we will explore cultural influences within our own lives and the lives of others from different ethnic backgrounds by examining universal qualities and its cultural variations. By the end of the course, students should have a strong understanding of what cross-cultural psychology is as well as the major theories in the field and how they are applied to contemporary research. Prerequisite: PSY 113

Prerequisite: PSY 113.

**PSY 3063 - Buyer Behavior (3)**

Studies in this course include consumer and organizational buying behavior, as well as determinants of this behavior. Consumer characteristics, including attitudes and behaviors, processing of information, as well as consumer cultural, psychological and communication theories are also studied. Course also examines industrial perspectives; the unique aspects of organizational markets and how they differ from individual consumer behavior. Prerequisite: (Same as MK 363) MK 203

Prerequisite: MK 203. Crosslisted as: MK 363.

**PSY 403 - Human Sexuality (3)**

Throughout this course, students will examine the biological, psychological, and cultural aspects of sexuality. Students will also review current and historical views on gender identity, sexual orientation and societal stereotyping. In addition, students will recognize differing views and beliefs regarding human sexuality. Other concepts such as connection and communication are also discussed. Prerequisite: PSY 113

Prerequisite: PSY 113.

**PSY 413 - The Psychology of Addiction (3)**

A study of the psychological and sociological factors relating to the problems of addiction. Special attention will be given to the effects which alcohol and other drugs have upon fetuses, children, adults, families, and communities. Prerequisite: PSY 113

Prerequisite: PSY 113.

**PSY 423 - Counseling Theories & Practices (3)**

This course prepares students to utilize contemporary approaches to counseling in a variety of industries. Throughout this course, students will learn effective counseling skills and body language including: basic attending skills, the use of open-ended questions, verbal and non-verbal behavioral cues, paraphrasing, reflective communication skills, confrontation, and active listening. Students will also examine empathic approaches for helping others. Students will study the ethical standards of counseling as well as theoretical approaches related to effective counseling styles. Additionally, students will examine real life experiences in counseling related to their chosen field of study. Prerequisite: PSY 113

Prerequisite: PSY 113.

**PSY 433 - Issues of Substance Abuse in Family Systems (3)**

This course is required/needed for students who wish to sit for Licensed Addiction Counselor Exam, through Behavior Health and Human Service Licensing Board of Indiana. Prerequisite: PSY 113

Prerequisite: PSY 113.

**PSY 443 - Advanced Forensic Psychology (3)**

An in-depth study of the etiology of criminal behavior. A critical analysis of mentally disordered, psychopathic, and sexually disordered offenders. Students acquire profiling and prediction skills. Prerequisites: PSY 383

Prerequisite: PSY 383.

**PSY 453 - Clinical Internship I (3)**

Field experience in psychology related occupations such as local mental health centers, work with local counselors, or school psychologists. May be taken concurrently with PSY 463. Prerequisites: Psychology major, senior standing and permission of the instructor

Prerequisite: Psychology major, senior standing and permission of the instructor .

**PSY 463 - Clinical Internship II (3)**

A continuation of PSY 453. May be taken concurrently with PSY 453. Prerequisite: Psychology major, senior standing and permission of the instructor

Prerequisite: Psychology major, senior standing and permission of the instructor .

**PSY 473 - Psychology Capstone Demonstration (3)**

This capstone will provide students the opportunities to integrate and synthesize previous coursework in psychology. Prerequisite: All required coursework in Psychology core

Prerequisite: All required coursework in Psychology core.

**PSY 483 - Counseling Issues in Substance Abuse (3)**

An examination of the special issues, populations, and treatment modalities specific to substance abuse counseling. Course can be used toward NAADAC certification for Addiction Professional in Training. Prerequisite: PSY 113

Prerequisite: PSY 113.

**PSY 493 - Issues & Ethics in Psychology & Counseling (3)**

Advanced level course provides an overview of legal and ethical aspects in the field of psychology and counseling with implications for the individual within the fields. Includes topics such as confidentiality, rights of clients, client records, equal protection for staff and clients, and discrimination. The American Psychological Association (APA) code of ethics and related codes are covered with an overview of ethical dimensions of practice. Prerequisite: PSY 113

Prerequisite: PSY 113.

**PSY 4001 - Independent Studies in Psychology (1)**

Credit earned through directed reading, independent study, research, or supervised field work. Maximum four hours credit. Prerequisite: Permission of Department Chair

Prerequisite: Permission of Department Chair.

**PSY 4002 - Independent Studies in Psychology (2)**

Credit earned through directed reading, independent study, research, or supervised field work. Maximum four hours credit. Prerequisite: Permission of Department Chair

Prerequisite: Permission of Department Chair.

**PSY 4003 - Independent Studies in Psychology (3)**

Credit earned through directed reading, independent study, research, or supervised field work. Maximum four hours credit. Prerequisite: Permission of Department Chair

Prerequisite: Permission of Department Chair.

**PSY 4004 - Independent Studies in Psychology (4)**

Credit earned through directed reading, independent study, research, or supervised field work. Maximum four hours credit. Prerequisite: Permission of Department Chair

Prerequisite: Permission of Department Chair.

# RSH-Research

**RSH 500 - Graduate Research Preparation (.5)**

This course will prepare learners to execute strategies for graduate research. Learners will demonstrate the ability to cite sources in APA Style format in order to maintain academic integrity in future graduate courses. Learners will use library resources for effective graduate-level research and writing. Additionally, learners will identify common plagiarism mistakes and how to avoid them.

**RSH 7093 - Research Statistics for Information Technology (3)**

Learners will focus on applied statistical research methods with an emphasis on information technology. Topics covered in this course will include; descriptive statistics, distributions, confidence intervals, hypothesis testing, and inference. Through the application of statistical methods, learners will conduct original research in their field. Prerequisite: Doctoral standing

Prerequisite: Doctoral Standing.

**RSH 8003 - Quantitative Research Methods (3)**

In this course, learners will examine quantitative research processes, including reading research materials, evaluating research materials, and developing research proposals. Learners will participate in developing and implementing a literature review process. Learners will also develop methods for researching print and online databases. Learners will review the American Psychological Association (APA) standards, guidelines, and the format of citations of materials (print and electronic) used in the dissertation process. Learners will develop a higher education research interest area using quantitative research design. Additionally, learners will evaluate how educational research contributes to the objectives of Trine University's doctoral program.

**RSH 8003 - Quantitative Research Methods (3)**

In this course, learners will examine quantitative research processes, including reading research materials, evaluating research materials, and developing research proposals. Learners will participate in developing and implementing a literature review process. Learners will also develop methods for researching print and online databases. Learners will review the American Psychological Association (APA) standards, guidelines, and the format of citations of materials (print and electronic) used in the dissertation process. Learners will develop a higher education research interest area using quantitative research design. Additionally, learners will evaluate how educational research contributes to the objectives of Trine University's doctoral program.

**RSH 8013 - Qualitative Research Methods (3)**

In this course, learners will examine qualitative research processes, including reading research materials, evaluating research materials, and developing research proposals. Learners will participate in developing and implementing a literature review process. Learners will also develop methods for researching print and online databases. Learners will review the American Psychological Association (APA) standards, guidelines, and the format of citations of materials (print and electronic) used in the dissertation process. Learners will develop a higher education research interest area using qualitative research design.

Additionally, learners will evaluate how educational research contributes to the objectives of Trine University's doctoral program.

**RSH 8023 - Research Design (3)**

In this course learners will develop the specialized skills relative to conducting research, research design, and evaluating and assessing research materials. Learners will apply methods of evaluating others' work and producing their own scholarly work. Learners will also participate in the creation of an individualized research question and hypothesis. Additionally, learners will prepare a research plan and research material that addresses the research question and hypothesis.

**RSH 8033 - Advanced Research Methodology (3)**

In this course, learners will evaluate tools that assist in effective educational research. Learners will engage in an in-depth study of the processes involved in conducting research. Learners will focus on the examination of the major methodological approaches to research. Additionally, learners will be immersed in the vocabulary, concepts, and methods of educational research. Learners also will examine the language of research through the various methods of conducting research and will synthesize research literature related to the development of a research plan. Learners will then report their findings. Prerequisites: RSH 8003 and RSH 8013

Prerequisite: RSH 8003 and RSH 8013.

# SA-Study Abroad

**SA 2000 - Study Abroad Semester (0)**

Trine offers three separate study abroad programs. You can enroll in semester, year-long, or summer programs through our partner providers. While enrolled in this course, a student is considered a full-time Trine University student.

**SA 2012 - Study Abroad Experience (12)**

Trine offers three separate study abroad programs. You can enroll in semester, year-long, or summer programs through our partner providers. While enrolled in this course, a student is considered a full-time Trine University student.

# SCI-Science

**SCI 121 - Introduction to Health Professions (1)**

This course is designed to help students interested in pre-health professional studies learn about various requirements and processes involved in the health profession of their choice. It will also highlight various services offered by Trine University to assist students as they pursue their professional goals. This course is intended for freshmen level students.

**SCI 412 - Senior Research Seminar (2)**

Project selection, initial preparation, and preliminary data collection for a major science research project that integrates several scientific disciplines, methods of analysis, the reporting of conclusions and communication skills. To be taken spring of junior year, course continues in SCI 422. This course will be graded pass/fail. Prerequsite: BIO 302 or CH 302

Prerequisite: BIO 302 or CH 302.

**SCI 422 - Science Research Project (2)**

An integrated research project that incorporates the basic and advanced sciences, mathematics and communication skills. This course must be taken the semester immediately following SCI 412. This course will be graded pass/fail. Prerequisite: SCI 412

Prerequisite: SCI 412.

**SCI 434 - Science Internship (4)**

An extended professional work experience in an area related to the student's major. The work experience consists of 200 documented work hours. The course will be graded pass/fail. Prerequisite: Permission of the Department Chair

Prerequisite: Permission of the Department Chair.

**SCI 4001 - Independent Studies in Science (1)**

Credit earned through directed reading, independent study, research, or supervised field work. Prerequisite: Permission of the Department Chair

Prerequisite: Permission of the Department Chair.

**SCI 4002 - Independent Studies in Science (2)**

Credit earned through directed reading, independent study, research, or supervised field work. Prerequisite: Permission of the Department Chair

Prerequisite: Permission of the Department Chair.

**SCI 4004 - Independent Studies in Science (4)**

Credit earned through directed reading, independent study, research, or supervised field work. Prerequisite: Permission of the Department Chair

Prerequisite: Permission of the Department Chair.

# SE-Software Engineering

**SE 153 - Client-side Databases (3)**

An introduction to the implementation and theory of databases. Students will be able to implement a SQL/relational database; employ data model and entity-relationship models; analyze and correct redundancy; apply relational algebra; analyze a system or situation with respect to data integrity; explain and manipulate semi-structured data (e.g. XML). Prerequisite: One application-programming course; Corequisite: MA 113 College Algebra or higher.

Prerequisite: One application-programming course. Corequisite: MA 113 College Algebra or higher.

**SE 153 - Client-side Databases (3)**

An introduction to the implementation and theory of databases. Students will be able to implement a SQL/relational database; employ data model and entity-relationship models; analyze and correct redundancy; apply relational algebra; analyze a system or situation with respect to data integrity; explain and manipulate semi-structured data (e.g. XML). Prerequisite: One application-programming course; Corequisite: MA 113 College Algebra or higher.

Prerequisite: One application-programming course. Corequisite: MA 113 College Algebra or higher.

**SE 233 - Systems Programming (3)**

Students learn to write C programs that utilize Linux systems calls which interact with the operating system. Students will be able to proficiently use the Linux command line; write simple Make files; write programs

which use Linux systems calls; write programs which can fork new processes or start new threads; write C programs which set up interprocess communication through, for example, the use of signals or pipes.

Prerequisite: CS 1123 or ECE 273

Prerequisite: ECE 273 or CS 1123.

**SE 303 - Server-Side Databases (3)**

An introduction to implement database concept on server side. Students will develop and test a database with multiple servers, using PHP or similar tool to offer good data; will assure access security; identify and justify methods of backup/recovery; explain consistency, availability, and partitioning, and the limits of these; exploit a non-relational database; develop a database that operates effectively without assurance of consistency. Prerequisite: SE 153

Prerequisite: SE 153.

**SE 303 - Server-Side Databases (3)**

Internet applications often use databases on remote serves. These are sometimes distributed, large, and non-relational, and they pose some difficulties. Students will develop and test a database with multiple serves, using PHP or similar tool to offer good data; will assure access security; identify and justify methods of backup/recovery; explain consistency, availability, and partitioning, and the limits of these; exploit a non-relational database; develop a database that operates effectively without assurance of consistency. Prerequisite: SE 153, SE 233

Prerequisite: SE 153, SE 233.

**SE 353 - Software Engineering (3)**

Is an introduction to software engineering form requirements definitions, through system modeling, specification and design, to verification and validation. Students will: explain project management issues including software cost estimation; determine applicable SDLC models; explain Agile methods (XP and Scrum); gather requirements; design architecture of a software system; create tests to assure quality of software; design and implement an effective graphical user interface. (Same as CS 2503) Prerequisite: CS 1123

Prerequisite: CS 1123. Crosslisted as: CS 2503.

**SE 383 - Computer Security (3)**

Covers issues and solutions in the area of computer security with emphasis on secure software development. Students will: discuss various attacks and vulnerabilities in a computer system (malware, denial of service, XSS, SQL injection, etc.) and choose corresponding solutions; compare cryptographic algorithms and security protocols; incorporate authentication and security protocols in applications; discuss internet privacy and ethical issues; apply security concepts, technologies and best practices to develop secure applications. Prerequisite: CS 1123

Prerequisite: CS 1123.

**SE 393 - Software Patterns & Team Development (3)**

This is a project-oriented course that teaches the code development process to students who can use an object-oriented computer language. Students will: identify activities of software project engineering; write a formal requirements document; perform object-oriented analysis of client requirements; use UML class and sequence diagrams to support object-oriented design; apply some software design patterns; implement designed software in a team supported by a version-control tool; use a professional-caliber GUI library to advantage; and follow coding standards. Prerequisite:  CS 2503 or SE 353

Prerequisite: CS 2503 or SE 353.

**SE 393 - Software Patterns & Team Development (3)**

This is a project-oriented course that teaches the code development process to students who can use an object-oriented computer language. Students will: identify activities of software project engineering; write a formal requirements document; perform object-oriented analysis of client requirements; use UML class and sequence diagrams to support object-oriented design; apply some software design patterns; implement designed software in a team supported by a version-control tool; use a professional-caliber GUI library to advantage; and follow coding standards. Prerequisite:  CS 2503 or SE 353

Prerequisite: CS 2503 or SE 353.

**SE 4001 - Contemporary Issues for Engineering (1)**

This is a seminar-based weekly course covering global perspectives on business and engineering, and the effects and responsibilities of engineers in society. Students will: understand sustainability and diversity and develop a broader perspective necessary to understand the impact of engineering solutions in an environmental and societal context; understand the complex global economy. (Same as ECE 4001) Prerequisite: Senior standing

Prerequisite: Senior standing. Crosslisted as: ECE 4001.

**SE 4002 - Project Management (2)**

Students will: work with a team to identify or elicit details of end-user needs; produce and present a project proposal; identify and assign responsibilities to team members based on an accepted proposal; work across disciplines to deliver a product or service to a client; explain both highly-structured and more agile engineering design processes. (Same as ECE 4002) Prerequisite: Advisor's consent

Prerequisite: Advisor's consent. Crosslisted as: ECE 4001.

**SE 4003 - Design Project (3)**

Students will: design and prototype a product; work with team members from other disciplines to collectively solve engineering problems; obtain and utilize information sources to solve engineering problems; consider the perspective of stakeholders as an integral part of the design process; incorporate appropriate engineering standards; identify economic, environmental, social, ethical, and safety implications of the design; demonstrate communication skills necessary for successful teamwork; write a formal report that documents the entire design-cycle, from the initial concept to a functioning prototype; and give an oral report presenting the final product. (Same as ECE 4003) Prerequisite: EE Majors: ECE 4002, ECE 343, ECE 483; CPE Majors: ECE 4002, ECE 343, ECE 373; SE Majors: ECE 4002, CS 2103, CS 2503 or SE 353

Prerequisite: EE Majors: ECE 4002, ECE 343, ECE 483; CPE Majors: ECE 4002, ECE 343, ECE 373; SE Majors: ECE 4002, CS 2103, CS 2503 or SE 353 . Crosslisted as: ECE 4003.

# SI-Social Innovation

**SI 213 - Theories & Philosophies of Social Innovation (3)**

Students are introduced to the altruistic and philanthropic drivers of social innovation, specifically focusing on how the desire to accrue value for society is becoming more influential than profit motive. The course asks students to examine (through a number of lenses) the emergence of the humanistic element in what have traditionally been capitalistic and technological fields. (Same as PHL 213)

Corequisite: None. Crosslisted as: PHL 213.

**SI 403 - Social Innovation Practicum (3)**

Students will learn and apply the steps that social entrepreneurs work through to operationalize social innovations and create social change: identifying a problem to address, developing a strategy to address the social need, fundraising, growing the organization, tracking results and maximizing impact. Students will develop a Theory of Change, Logic Model and Social Venture Plan for self-selected problem OR engage in a semester-long exploration of a social challenge or operational social innovation, with which they will actively engage during an Alternative Break Program (ABP) during Thanksgiving or Spring Break. Prerequisites: SI/PHL 213, LDR 403, and pursuit of Social Innovation minor approved by academic advisor or permission of instructor.

Prerequisite: SI 213, LDR 403, and pursuit of Social Innovation minor approved by academic advisor or permission of instructor. .

# SM-Sport Management

**SM 133 - Contemporary Issues in Sport (3)**

Discussion of the problems and issues facing sport managers today. Analysis of the relationship between sport and culture. Topics may include commercialization, amateurism and socialization in sports.

**SM 223 - History of Physical Education & Sport (3)**

The significance of physical education and sport from the ancient Greeks through modern times. The development of physical education as a broad-based academic discipline and sport management as a natural outgrowth of the field.

**SM 313 - Principles of Sport & Recreation Management (3)**

A study of the management, marketing, financial and legal principles within a sports and recreation operation and the primary components and support structures of the industry. The purpose is to examine and gain an understanding of all facets of running a team or sporting organization. A significant research project will be due at the end of the course.

**SM 333 - Sports Law and Ethics (3)**

This course examines legal concepts and cases and ethical issues related to sport, recreation, and physical activity. Students will analyze complex legal and ethical issues facing leagues, teams, event organizers, participants, fans, and the sport community as a whole. Topics to be addressed include law and management in sport; human resource management in sport including labor relations and the law of agency; strategic management and governance of sport organizations at both the amateur and professional levels; operating venues and event management including liability, contract, and accessibility issues; and marketing management.

Prerequisite: none.

**SM 393 - Sport Psychology (3)**

Study of the underlying mechanisms that coordinate individuals' thoughts, feelings and behavior, and how these processes are impacted by the sport setting. Psychological factors to be discussed include motivation and aggression.

**SM 403 - Internship Sport Management (3)**

Observation of and participation in a field-related experience under the direction of a field supervisor and a University supervisor. Must have the approval of the Department Chair

Prerequisite: Must have the approval of the Department Chair.

**SM 412 - Business Planning in Sport & Recreation (2)**

The creation of a business plan for a sport/recreation operation. Prerequisite: MGT 303

Prerequisite: MGT 303.

**SM 413 - Organization & Administration of Physical Education & Athletics (3)**

Theories establishing the procedures for facility, curriculum and faculty development in physical education and athletics are examined.

**SM 416 - Internship in Sport Management (6)**

Observation of and participation in a field-related experience under the direction of a field supervisor and a University supervisor. Must have the approval of the Department Chair

Prerequisite: Must have the approval of the Department Chair.

**SM 423 - Capstone Experience in Sport Management (3)**

The culminating final project of a Sport Management major. With the guidance of a professor, the student will participate in a project-based learning opportunity with significant work expected outside of class. Students will apply lessons in marketing, sales, and event operations to a real-life sporting event. Weekly assignments, a reflective paper, and a presentation are required components of the class.

Prerequisite: Senior Sport Management major only or with approval of the instructor. Corequisite: none. Crosslisted as: none.

**SM 453 - Facility Planning (3)**

The purpose of this class is to examine all the variables an administrator must consider when building or remodeling a sport or fitness facility. Cost, construction, materials, legal issues, and handicap accessibility are a few of the topics to be discussed. Field trips to local sport facilities and arena's will be scheduled. The design of a new facility is one of the class projects.

# SOC-Sociology

**SOC 103 - Principles of Sociology (3)**

A presentation of the basic concepts and principles of sociology, designed to develop a system of thought about the nature of society and major special issues, such as ethnic patterns, social stratification, youth, educational, and religious institutions.

**SOC 313 - Topics in Sociology (3)**

Selected topics in sociological content such as criminology, minority groups, urbanization, and the like. Topics will vary from semester to semester. Prerequisite: SOC 103

Prerequisite: SOC 103.

**SOC 323 - The Family (3)**

An analysis of problems and relationships in the family setting: divorce, mobility, generation differences, changing role of women and youth, delinquency, cross cultural patterns. Prerequisite: PSY 113 or SOC 103

Prerequisite: PSY 113 or SOC 103.

**SOC 333 - Art, Society & Technology (3)**

An interdisciplinary effort to place modern technology within a social, cultural and historical context. (Same as PHL 333) Prerequisite: ENG 133

Prerequisite: ENG 133. Crosslisted as: PHL 333.

**SOC 343 - Social Psychology (3)**

An introduction to the measurement and principles of human interaction and group behavior, including attitude change, prejudice, attraction, love, altruism, aggression, conformity, group dynamics, crowding, and other current social issues. (Same as PSY 343) Prerequisite: PSY 113

Prerequisite: PSY 113. Crosslisted as: PSY 343.

**SOC 363 - Human Behavior & Counseling (3)**

Examines the theory and practice of counseling with a corporate of social service setting Exposure to a variety of therapeutic techniques. Experience first-hand the complexities of the human mind through a case-study approach. Direct versus indirect forms of interventions are explored. (Same as PSY 363) Prerequisite: PSY 113

Prerequisite: PSY 113. Crosslisted as: PSY 363.

# SPN-Spanish

**SPN 103 - Spanish Conversation I (non-native speakers) (3)**

An introduction to the Spanish language with an emphasis on functional conversation skills. Vocabulary development and pronunciation within communicative contexts are stressed. No previous study of Spanish is required. NATIVE SPEAKERS OF SPANISH MAY NOT REGISTER FOR SPN 103

**SPN 113 - Spanish Reading & Writing I (3)**

An introduction to the Spanish language that includes vocabulary development and the basics of grammar structure with an emphasis on reading and writing, as well as developing cultural insight into Hispanic countries. No previous study of Spanish is required.

**SPN 123 - Spanish II (3)**

A continuation of the first semester of language (SPN 113), the focus of this second semester of beginning Spanish is to continue the development of listening, speaking, reading, and writing skills. Latin American and Spanish cultures are covered to provide a cultural insight in the target language. Prerequisite: SPN 113 or by placement

Prerequisite: SPN 113 or by placement.

**SPN 203 - Spanish III (3)**

An intermediate Spanish class with an emphasis on reading and writing skills which includes vocabulary and grammar instruction. Students explore Hispanic cultures with readings and videos based on historical, as well as current events to develop an understanding of the Hispanic world. Students analyze authentic literary selections with an expanded working vocabulary and write Spanish compositions with improved creative expression. Communicative skills are also emphasized through personal reflections and discussions with peers. Prerequisite: SPN 123 or by placement

Prerequisite: SPN 123 or by placement.

**SPN 213 - Spanish IV (3)**

A continuation of Spanish III, with an emphasis on reading comprehension of more complex texts, such as prose, fiction and articles. In addition, students will improve writing fluency and accuracy in essays in Spanish. The difficulty level of the reading selections increases in this course. Prerequisite: SPN 203

Prerequisite: SPN 203.

**SPN 303 - Spanish Language (3)**

Review of vocabulary and Spanish grammar essentials with analysis and discussion of literary texts and videos through extensive reading and writing activities as well as oral presentations and class discussions. Prerequisites: SPN 213

Prerequisite: SPN 213.

**SPN 313 - Spanish Writing & Composition (3)**

This course emphasizes the development of writing skills and critical reading with Spanish compositions in comparative essay, the argumentative essay as well as academic and research papers. Prerequisite: SPN 213

Prerequisite: SPN 213.

**SPN 323 - Spanish Culture (3)**

Introduction to popular culture and diversity in the Spanish-speaking world and the historical, political, economic and social aspects through interdisciplinary readings, videos, as well as material published on the internet to develop critical understanding and appreciation of a variety of Hispanic cultures. Prerequisites: SPN 213

Prerequisite: SPN 213.

# SP-Speech

**SP 203 - Effective Speaking (3)**

Throughout this course, students will learn communication principles to improve public speaking and listening skills. Through application, students will develop confidence in the delivery of oral presentations. Additionally, students will learn how to organize, outline, research, and conduct audience analysis to prepare for effective speaking.

Prerequisite: none. Corequisite: none.

# SR-Sport Recreation

**SR 343 - Internship in Sport & Recreation I (3)**

Observation of and participation in a field related experience under the direction of a field supervisor and a University supervisor. Internship opportunities are limited to Sport and Recreation majors only and must have the approval of the Department Chair. Prerequisites: Permission of the Department Chair and written description of internship duties.

Prerequisite: Permission of the Department Chair and written description of internship duties.

**SR 353 - Internship in Sport & Recreation II (3)**

Continuation of observation of and participation in a field related experience under the direction of a field supervisor and a University supervisor. Internship opportunities are limited to Sport and Recreation majors only and must have the approval of the Department Chair. Prerequisites: Permission of the Department Chair and written description of internship duties.

Prerequisite: Permission of the Department Chair and written description of internship duties.

# SUR-Surgical Technology

**SUR 104 - Introduction to Surgical Technology (4)**

Prepares students to apply knowledge of safety in the workplace and basic safety techniques; including how to create and maintain a safe working environment. Teaches aseptic procedures with emphasis placed on safety and division of duties when establishing a sterile field, scrubbing and donning of surgical attire, and gowning and gloving other team members. Prepares students to apply knowledge of anatomy and physiology, surgical instruments, sutures, needles, sponges, drugs used during surgery, and dressings. Prepares students to apply knowledge of drainage systems and tubing, syringes and hypodermic needles, sponges, and instrument counts.

Prerequisite: None. Corequisite: None. Crosslisted as: None.

**SUR 114 - Clinical Experience I (4)**

This course provides students with knowledge of basic principles and practices involving hazards, laws, and ethics related to the field of surgical technology. It teaches laws and regulations, documentation and consents, and identifies potential hazards and safety precautions utilized in the operative environment. This course prepares students to apply knowledge of the surgical technologist roles and responsibilities, professional relationships, and the psychological needs of the surgical patient; emphasis is placed on the operating environment. In addition, quality and end-of-life ethical issues are presented with emphasis on the biopsychosocial needs of the patient. This course also provides the surgical technology student with an overview of surgical services and associated departments with observation and hands-on experiences relevant to the surgical patients' care.

**SUR 124 - Clinical Experience II (4)**

This course provides students with actual on-the-job learning opportunities. It is conducted in surgical facilities and provides students a clinical experience with a variety of pre-, intra-, and post-operative assignments. Students will have opportunities to

observe and assist in associated departments (L&D, endoscopy, and SPD). IN the operating room, the course will consist of the student in the observation role with transition to the second scrub and first scrub roles. Prerequisites: SUR 104, SUR 114 and HS 104

Prerequisite: SUR 104, SUR 114 and HS 104.

**SUR 134 - Surgical Procedure I (4)**

This course prepares students to think about procedures in a style similar to that of the surgeon. It is constructed in such a way as to teach basic surgical anatomy, instrumentation and procedural steps. The course introduces students to diagnostic procedures, endoscopic surgery and robotics, general obstetrics and gynecology, and genitourinary surgeries. Prerequisite: SUR 104, SUR 114, HS 104

Prerequisite: SUR 104, SUR 114 and HS 104.

**SUR 218 - Clinical Experience III (8)**

This course provides students with actual on-the-job learning opportunities. It is conducted in a surgical facility and provides students with a clinical experience with a variety of pre-, intra-, and post-operative assignments. Students will have opportunities to observe and assist in associated departments (L&D, OB, endoscopy, interventional radiology, SPD). The course will consist of second scrubbing with the transition to first scrubbing. Prerequisite: SUR 124, SUR 134 and HS 114

Prerequisite: SUR 124, SUR 134, HS 114.

**SUR 223 - Capstone for the Surgical Technologist (3)**

This course is designed to provide a comprehensive review and knowledge assessment in preparation for taking a national credentialing exam. The course will also include an opportunity for the evaluation of skills, professional development, and critical thinking skills through case studies reflecting experiences often encountered during surgical technology clinical experience and in the surgical work environment. Prerequisite: SUR 218 and SUR 234

Prerequisite: SUR 218 and SUR 234.

**SUR 228 - Clinical Experience IV (8)**

This course provides students with actual on-the-job learning opportunities. It is conducted in a surgical facility and provides students a clinical experience with a variety of pre-, intra-, and post-operative assignments. Emphasis is placed on the scrub and circulating roles of the surgical technologist including aseptic technique and basic surgical procedures while working as a member of the surgical team. Prerequisites: SUR 218 and SUR 234

Prerequisite: SUR 218 and SUR 234.

**SUR 234 - Surgical Procedures II (4)**

This course prepares students to think about procedures in a style similar to that of the surgeon. It is constructed in such a way as to teach basic surgical anatomy, instrumentation and procedural steps. The course introduces students to general surgical techniques involved during orthopedic, cardiothoracic, peripheral vascular, and neurosurgeries. Prerequisites: SUR 124, SUR 134 and HS 114

Prerequisite: SUR 124, SUR 134 and HS 114.

**SUR 244 - Surgical Procedures III (4)**

This course prepares students to think about procedures in a style similar to that of the surgeon. It is constructed in such a way as to teach basic surgical anatomy, instrumentation and procedural steps. The course introduces students to otorhinolaryngologic surgeries, ophthalmic surgeries, oral and maxillofacial, and plastics and reconstruction surgeries. Prerequisites: SUR 218 and SUR 234

Prerequisite: SUR 218 and SUR 234.

# SYS-Systems Engineering

**SYS 5013 - Systems Engineering Analysis (3)**

This course provides learners a foundation in the practice of systems engineering (SE) tools, processes and related analyses. Students will be challenged to design, develop, and analyze complex systems in a variety of technical disciplines using industry standard SE concepts and methods. Post-processing tools and techniques are covered to analyze and present outcomes to "what if" type scenarios.

**SYS 5113 - Systems Validation and Testing (3)**

This course provides an overview of systems validation and testing tools, methods, and processes for use in systems engineering efforts. The systems engineering verification and validation process is covered to ensure a product's quality and fit for use before final customer delivery.

**SYS 5213 - Model Based Systems Engineering (3)**

This course prepares students in the foundations of Model Based Systems Engineering (MBSE). MBSE principles and techniques are covered while maintaining an emphasis on the needs of customers and other stakeholders. System Markup Language (SysML) models are covered to support complex system design, analysis, verification, and validation efforts.

# THE-Theatre

**THE 100 - Theatre Production (no credit) (0)**

Improvement of sills in theatrical production in conjunction with Trine University's Drama Club, including but not limited to acting, directing, technical theatre, or front-of-house experiences. This course is open to all students. This course is graded on a satisfactory/unsatisfactory basis.

**THE 101 - Theatre Production (1)**

Improvement of skills in theatrical production in conjunction with Trine University's Drama Club, including but not limited to acting, directing, technical theatre, or front-of-house experiences. This course is open to all students. This course is graded on a satisfactory/unsatisfactory basis.

**THE 103 - Introduction to Theatre (3)**

Understanding the roles of playwrights, actors, directors, designers, and audiences within the "living art" of theater. Demonstrates the relationship between art and culture through the study of, participation in, and viewing of theater.

**THE 113 - Beginning Stage Acting (3)**

Students will learn a basic version of Stanislavsky's approach to acting focusing on stage directions, and the interplay of physical and emotional instruments in acting.

Prerequisite: None. Corequisite: None. Crosslisted as: None.

**THE 373 - Special Topics in Theatre (3)**

A focused study of special interest related to the theatre or its practices, including, but not limited to, dramatic literature, history and criticism, performance, technical aspects, or theatre in education.

Prerequisite: None. Corequisite: None. Crosslisted as: None.

# UEI-University Exper-International

**UEI 141 - Paralinguistics of English Conversation (1)**

This course helps non-native English-speaking students improve and build confidence in their English-speaking skills. Students gain the ability to engage fully in academic discussion and informal conversations through focused pronunciation practice and active participation in structured conversation activities. Students analyze the verbal and non-verbal tools as well as the cultural cues utilized in American English discourse.

Corequisite: Lab Required.

**UEI 191 - Adjusting to US Campus Life (1)**

First-year international students learn about subjective cultural aspects of American university campuses, such as the American work ethic, the concept of time, and how to make a good first impression. In turn, students present their own cultures to other students and professors. They actively participate in conversations about other cultural values, campus life, and aspects of being a student here at Trine University. They learn about rules, laws, and policies, both on campus and in the local community, and they practice reacting to various emergency situations. They internalize important vocabulary to assist them in adjusting to life on an American university campus, and they learn to recognize the stages of culture shock and some strategies of coping with it. This course requires a lab portion that must be taken concurrently.

Corequisite: Lab Required.

**UEI 500 - Intl Grad Learning Orientation (0)**

Throughout this course, international graduate students will discover Trine University's academic policies and graduate procedures. Students will learn how to utilize the appropriate campus resources to make timely and effective educational decisions. Additionally, students will develop strategies to be successful graduate students. This course will be graded as satisfactory/unsatisfactory.

# UE-University Experience

**UE 012 - Academic Foundations (2)**

This course helps students develop the proficiency needed to be successful in other college courses. The focus is on preparing students to do college level reading and writing and learning by building on each student's academic skills. This is a non-credit, preparatory class.

**UE 101 - University Experience (1)**

This course offers resources for success in learning for students new to Trine University. This course will assist students in becoming more proficient learners, understanding self and others, and learning personal life skills. This course will present information about Trine University offices and services to familiarize students with resources and procedures.

**UE 103 - College Success Skills (3)**

Upon completion of this course, students will be able to apply Trine's academic policies and procedures and utilize the appropriate resources to make timely and effective educational decisions. Students will be able to develop a system and set of strategies to apply college success skills.

Prerequisite: Must be recommended by Trine's Academic Success Center.

**UE 111 - Online Learning Orientation (1)**

This course offers resources for success in learning for students new to Trine University. This course will assist new students in becoming acclimated to the university, and identifying the expectations of a Trine University student while providing them to

opportunity to become familiar with the course management system (Moodle). This course will also present information about Trine University offices and services to familiarize students with resources and procedures. This is a four week course.

**UE 121 - International Learning Orientation (1)**

(PASS/FAIL grading system) This course offers resources for success in learning for international students new to Trine University. This course will assist new international students in becoming acclimated to the university, and understanding expectations as a Trine University learner while allowing them to become familiar with the course management system (Moodle). This course will also present information about Trine University offices and services to familiarize students with resources and procedures. This is a four week course.

**UE 200 - Academic Coaching (0)**

(PASS/FAIL grading system) This course provides an opportunity to build and reflect on college success skills with the assistance of an academic coach. It is required for students on academic probation.

# WS-Womens Studies

**WS 103 - Introduction to Womens Studies (3)**

Introduction to Women's Studies offers an interdisciplinary exploration of the psycho-sociological construction of a woman's gender identity. It analyzes the historical progression of gender roles and feminist theory through a confluence of social, cultural, economic, political, geographic, and institutional pressures. The course examines how these components intersect in order to define what it is to be a woman in contemporary times. Prerequisite: ENG 143

Prerequisite: ENG 143.

# XR-Extended Reality

**XR 303 - 3D Modeling & Design for Extended Reality (3)**

Students use industry-standard 3D computer graphic software to apply fundamentals of 3D modeling and design to produce optimized content for augmented and virtual reality. Students learn to create captivating visuals for XR experiences using 3D animation techniques.

Prerequisite: none. Corequisite: none.

**XR 313 - Mixed Reality Development & Application (3)**

This course introduces students to the fundamentals of mixed reality applications. Students will learn how to determine the distinctions between smartphone and headset mixed reality applications and how to apply them to real-world problems. Students are exposed to industry-standard API software for AI-powered mixed reality application development. Prerequisite: CSIT 163

Prerequisite: CSIT 163. Corequisite: none.

**XR 323 - Introduction to VR Development (Unity Course) (3)**

In this interactive course, students will develop and build virtual reality (VR) applications. Students will think creatively about VR as a medium and then construct a VR application using an industry-standard game engine. The course will prepare students to take the Unity Associate Programmer Certification. Prerequisite: XR 343

Prerequisite: XR 343. Corequisite: none.

**XR 343 - Introduction to AR Development (Unity Course) (3)**

Students will learn about computer-human interaction that combines digital and physical experiences with the use of Augmented Reality (AR). AR applications will be created using an industry-standard game engine. Completion of this course prepares students to take the Unity Associate Game Developer Certification. Prerequisite: XR 313

Prerequisite: XR 313. Corequisite: none.

**XR 413 - Interdisciplinary Applications of Extended Reality (3)**

This course will cover applications of extended reality (XR). The use of XR across multiple industries is explored. Students will learn to solve real world issues through the creation of XR prototypes.

Prerequisite: none. Corequisite: none.

**XR 483 - Extended Reality Capstone Proposal (3)**

This course focuses on Extended Reality (XR) technologies and identifying market gaps using industry frameworks. Students articulate project value and feasibility to stakeholders using asset creation, optimization, and UX design. Final deliverables include a detailed project proposal and a formal presentation. Prerequisite: Senior standing

Prerequisite: Senior Standing.

**XR 493 - Extended Reality Capstone Project (3)**

This course uses the proposal from XR 483 to create an end-to-end XR project. Students will integrate art, UI/UX design, and programming techniques for effective solutions. Final deliverables consist of a project plan, functional XR application, and formal stakeholder presentation. Prerequisite: XR 483

Prerequisite: XR 483 Extended Reality Capstone Proposal.

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(Dates denote years of active service as a trustee.)

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Brooks College of Health Professions
A.S.N. (Ivy Tech Community College); B.S.N., M.S.N. (Western Governors University); Ph.D. (Capella University)

Lingxiao “Jenson” Jiang (2015) *Associate Director of Global Partnerships*
Instructor, TrineOnline
Office of International Services

College of Graduate and Professional Studies
B.S. (The University of Hong Kong); M.B.A. (Trine University)

Bradley Jopek (2024) Director of Music Program
Assistant Professor, Music Program
Jannen School of Arts & Sciences
B.M. (Westfield Academy & Central School); M.M.s (University of Louisville); D.M.A. (University of Maryland)

James Kamm (2024)
Assistant Professor, Wade Department of Mechanical and Aerospace Engineering
Allen School of Engineering & Computing
B.S. (Carnegie-Mellon University); Ph.D. (Ohio State University)

Haseeb Kazi (2006) *Director of Study Abroad*
Professor, Department of Mathematics
Jannen School of Arts & Sciences
B.S. (University of Punjab), M.S. (Quaid-I-Azam University), M.S., Ph.D. (Southern Illinois University)

Chad Keefer (2005) *Department Chair*
Associate Professor, Department of Physics
Jannen School of Arts & Sciences
B.S., M.A., Ed.D. (Ball State University)

Madison Keptner (2023)
Assistant Professor, Department of Exercise Science
Rinker-Ross School of Health Sciences
B.S. (Trine University); M.S., Ph.D. (Concordia University Chicago)

Kinsey Cotton Kelly (2012)
Associate Professor, Bock Department of Biomedical Engineering
Allen School of Engineering & Computing
B.S., Ph.D. (Louisiana Tech University)

Mahesh Khadka (2016)
Associate Professor, Department of Electrical & Computer Engineering
Allen School or Engineering & Computing
B.S. (Nepal Engineering College); M.S., Ph.D. (Oklahoma State University)

Anthony Kline (2012) *Vice President for Academic Affairs*
Professor, Education
Franks School of Education
B.S., M.A., Ph.D. (Ball State University)

Jon Koch (2014)
Professor, Wade Department of Mechanical & Aerospace Engineering
Allen School of Engineering & Computing
B.S. (Valparaiso University); M.S., Ph.D. (Stanford University)

Marek Kolar (2009)*H. Phillip Conrad Chair, Faculty President*
Associate Professor, Business
Ketner School of Business
B.B.A. (Northwood University); M.A. (Western Michigan University);
Ph.D. (Michigan State University)

Nayeong Kong (2024)
Assistant Professor, Department of Mathematics and Actuarial Science
Jannen School of Arts Sciences
B.S., M.S., Ph.D. (Pusan National University); Ph.D. (Temple University)

Rachelle Kuhn (2022) *Department Chair*
Assistant Professor, Department of Exercise Science
Rinker-Ross School of Health Sciences
B.S. (Ball State University); M.P.H. (University of Toledo); Ed.D. (Lincoln Memorial University)

Alex Kutsenok (2022)
Assistant Professor, Department of Computer Science and Information Technology
Allen School of Engineering & Computing
B.S. (Rose-Holman Institute of Technology); M.S. (Indiana University)

Vinnie Lang (2014)
Assistant Professor, Department of Exercise Science
Rinker-Ross School of Health Sciences
B.A., M.S. (Purdue University)

Brian Lapp (2020)
Associate Professor, Master in Physician Assistant Studies Program
Brooks College of Health Professions
B.A. (Wittenberg University); M.S. (Miami University); M.S. P.A.-C. (Western Michigan University)

Anthony Layson (2009)
Professor, Department of Science
Rinker-Ross School of Health Sciences
B.Sc. (Indiana-Purdue University); Ph.D. (Iowa State University)

Drew Lehman (2022) *Senior Academic Director*
Instructor
College of Graduate and Professional Studies
B.S. (Ferris State University); M.B.A. (Trine University)

Dennis Lessard (2024)
Assistant Professor
College of Graduate and Professional Studies
B.A. (Arizona State University); M.A. (Central Michigan University); Ph.D. (Northcentral University)

Matthew Liberatore (2024) *Department Chair*
Professor, McKetta Department of Chemical and Bioprocess Engineering
Allen School of Engineering & Computing
B.S. (University of Illinois Chicago); M.S., Ph.D. (University of Illinois Urbana-Champaign)

Changhong "John" Liu (2019)
Assistant Professor, Wade Department of Mechanical & Aerospace Engineering
Allen School of Engineering & Computing
B.S. (Chongging Jiaotong University); Ph.D. (University of Kansas)

Jennifer Lloyd (2018) *Director, Surgical Technology*
Instructor, Associate of Applied Science in Surgical Technology Program
Brooks College of Health Professions
Surgical Technologist (University of Saint Francis); B.S., HCM (Siena Heights University)

Amanda Malefyt (2012) *Department Chair*
Professor, McKetta Department of Chemical & Bioprocess Engineering
Allen School of Engineering & Computing
B.S. (Tri-State University); Ph.D. (Michigan State University)

Colton Martens (2023)
Assistant Professor, Department of Science
Rinker-Ross School of Health Sciences
B.S.(St. Ambrose University); Ph.D. (Ohio State University)

Melissa Mayus (2017)
Associate Professor, Department of Humanities & Communication
Jannen School of Arts & Sciences
B.A. (University of Notre Dame); M.A. (Saint Louis University); M.A. (University of Iceland); Ph.D. (University of Notre Dame)

Oriana McBride (2021)
Instructor, Department of Physics
Jannen School of Arts & Sciences
B.S. (Trine University)

Matthew McLin (2023)
Assistant Professor, Department of Humanities and Communication
Jannen School of Arts & Sciences
B,A. (Texas Christian University); M.A., Ph.D. (Florida State University)

Andrea Mitofsky (2008)
Professor, Department of Electrical & Computer Engineering
Allen School of Engineering & Computing
B.S., M.S., Ph.D. (University of Illinois)

Hemin Mohammed (2021)
Assistant Professor, Reiners Department of Civil & Environmental Engineering
Allen School of Engineering & Computing
B.S. (University of Tikrit); M.S., Ph.D. (University of Kansas)

Kevin Molyet (2009)
Associate Professor, Department of Design Engineering Technology
Allen School of Engineering & Computing
B.S., M.S., Ph.D. (University of Toledo)

Dawn Moore (2015-2020, 2023)
Associate Professor, Business
Ketner School of Business
B.A. (Indiana University); M.B.A. (Indiana Wesleyan University); Ph.D. (Indiana Tech)

Timothy J. Murphy (2008)
Assistant Professor, Reiners Department of Civil & Environmental Engineering
Allen School of Engineering & Computing
B.S. (Virginia Polytechnic and State University); M.S. (University of Texas)

Stephanie Myers (2021)
Associate Professor, Department of Science

Rinker-Ross School of Health Sciences
B.S. (Adrian College); M.S., Ph.D. (University of Florida)

Cindy Neyer (1998)
Associate Professor, Department of Physics
Jannen School of Arts & Sciences
B.S. (University of Kansas); Ph.D. (Iowa State University)

Angelia Niederhelman (2017)
Associate Professor, Department of Mathematics and Physics
Jannen School of Arts & Sciences
B.S. M.S. (Indiana – Purdue University, Fort Wayne)

Jill Noyes (2019)
Assistant Professor, Department of Humanities and Communication
Jannen School of Arts & Sciences
B.A. (Purdue University); M.S., M.S. L. (Indiana University Purdue University Indianapolis)

Beth O'Rourke (2023) *Director, Doctorate of Occupational Therapy*
Associate Professor, Doctorate of Occupational Therapy Program
Brooks College of Health Professions
B.S. (Bowling Green State University); D.O.T. (Belmont University)

Francisco Ortiz (2015) *Vice President Student Affairs, Faculty Athletic Representative*
Instructor, Criminal Justice
Office of Student Affairs
B.S. (Trine University); M.S. (Indiana Wesleyan University)

Cynthia Palmer (2019)
Assistant Professor, College of Health Professions
Brooks College of Health Professions
B.S. (Saint Mary's College); M.S. (Indiana University School of Medicine); Ph.D. (University of Notre Dame)

Sasanka Panda (2023)
Instructor, Graduate Programs
College of Graduate and Professional Studies
M.T. (Indian Institute of Technology, Kharagpur)

Hong Park (2009)
Professor, Department of Science
Rinker-Ross School of Health Sciences
B.S. (Pukyong National University) M.S., Ph.D. (University of Wisconsin - Milwaukee)

John Patton (2014)
Professor, Bock Department of Biomedical Engineering
Allen School of Engineering and Computing
B.S. (University of Michigan); M.S. (New Mexico State University); Ph.D. (Rice University)

Alecia Pfefferkorn (2022)
Assistant Professor, Education
Franks School of Education

B.S., M.Ed. (Indiana University)

Von Plessner, (2023)
Instructor, TrineOnline
College of Graduate and Professional Studies
B.S. (Difiance College); M.B.A., Ph.D. (University of Toledo)

Joshua Pranger (2019) *Executive Director of Academic Operations*
Instructor, TrineOnline
College of Graduate and Professional Studies
B.S. (Indiana University); M.S. (Indiana Tech)

Mark Pranger (2023)
Instructor
College of Graduate and Professional Studies
B.S. (Purdue University-Fort Wayne); M.B.A. (Indiana Institute of Technology)

Kimberly Precht (2019)
Assistant Professor, Department of Physics
Jannen School of Arts & Sciences
B.S. (Kansas State University); M.S. (University of Iowa)

Brenda Prosser (2024)
Assistant Professor, Doctorate of Occupational Therapy Program
Brooks College of Health Professions
B.S. (Western Michigan University); DrOT (Valparaiso University)

Janelle Pulczinski (2020) *Director, Amy Nicholls Writing Center*
Assistant Professor, Department of Humanities & Communication
Jannen School of Arts & Sciences
B.A. (College of St. Scholastica); M.A. (University of Nebraska); M.A., Ph.D. (University of Wisconsin-Madison)

David Quist (2019)
Associate Professor, Science Department
Rinker-Ross School of Health Sciences
B. S. (College of Literature, Science, and the Arts); M.A., Ph.D. (Krieger School of Arts and Sciences);

Jeffrey Raymond (2014) *Chief Chemical Hygiene Officer*
Instructor, Department of Science
Rinker-Ross School of Health Sciences
B.S. (Michigan State University); M.S. (Trine University)

Jeremy Rentz (2010) *William & Patricia Schantz Professorship in Civil Engineering*
Professor, Reiners Department of Civil & Environmental Engineering
Allen School of Engineering and Computing
B.S., Ph.D. (University of Iowa)

Deborah Richard (2019)*Department Chair*

Assistant Professor, Business
Ketner School of Business
B.A., MBOL, MBA (Defiance College)

Patrick Ridout (2016)

Instructor
Information Services, Academic Success Center
B.A. (Indiana University Southeast); M.L.I.S. (Indiana University)

Megan Rosswurm (2019)
Instructor, Associate of Applied Science in Surgical Technology Program
Brooks College of Health Professions
A.A.S. (University of Saint Francis)

Jodi Sandvik (2019)
Associate Professor, Doctorate of Physical Therapy Program
Brooks College of Health Professions
B.S. (Marquette University); M.S. (Miami University); D.P.T. (Drexel University); DS.C. (Rockey Mountain University)

Rizacan Sarikaya (2021)
Assistant Professor, Wade Department of Mechanical & Aerospace Engineering
Allen School Engineering & Computing
B.Sc. (Istanbul Technical University); M.Sc., Ph.D. (University of Kansas)

Ryan Schnurr (2022)
Assistant Professor. Department of Humanities & Communication
Jannen School of Arts & Sciences
B.A. (Huntington University); M.A. (University of Illinois at Chicago): M.A., Ph.D.-ABD (Purdue University)

Sameer Sharma (2008) *Department Chair, Clayton W. Abrams Chair*
Professor, Department of Electrical & Computer Engineering
Allen School of Engineering and Computing
B.S. (Punjab Engineering College, India); M.S. (Brandeis University); M.S.E., Ph.D. (Oklahoma State University)

Michael Smith (2021)
Assistant Professor, Department of Mathematics and Actuarial Science
Jannen School of Arts & Sciences
B.S., M.S. (Purdue University)

Vernon Stanger (2015)
Lecturer, Business
Ketner School of Business
C.P.A., M.B.A. (Indiana Purdue Fort Wayne)

Lexi Staten (2019) *Dean*

Assistant Professor, Department of Exercise Science
Rinker-Ross School of Health Sciences
B.S. (Purdue University); M.S. (Texas Woman's University)

Jennifer Staude (2017) *Director, Honors Program, Department Co-Chair*

Associate Professor, Department of Science
Rinker-Ross School of Health Sciences
B.S. (Alma College); Ph.D. (University of Notre Dame)

Michael Staude (2018)
Associate Professor, Department of Science

Rinker-Ross School of Health Sciences
B.S. (University of Northern Iowa); Ph.D. (Notre Dame)

Laurie Stockton-Moreno (2020) *Director of Montessori Education*
Assistant Professor, Education
Franks School of Education
B.S., M.S. (University of Texas)

Steven Sullivan (2015)
Associate Professor, Doctorate of Physical Therapy Program
Brooks College of Health Professions
M.B.A. (Bethel College); D.P.T. (Creighton University); Ph.D.-IP (Nova Southeastern University)

Chelsea Superczynski (2022)
Assistant Professor, Education
Franks School of Education
B.S. (Daemen College); M.S. (Marian University)

Zoe Swaidner (2022)
Instructor-Labs, Department of Science
Rinker-Ross School of Health Sciences
B.S. (Trine University)

Catherine Swick (2010)

Associate Professor
Rinker-Ross School of Health Professions
B.S., M.Ed., Ph.D. (Bowling Green State University)

James Taylor (2024)
Instructor, McKetta Department of Chemical & Bioprocess Engineering
Allen School of Engineering and Computing
APS (MIAT College of Technology)

Joseph Thompson (2010)
Instructor, Wade Department of Mechanical & Aerospace Engineering
Allen School of Engineering and Computing
B.S. (Trine University)

Alison Todd (2016)
Associate Professor, Education
Franks School of Education
B.A. (Union College); M.Ed. (Lesley University); M.A. (Castleton State College)

Megan Tolin (2019) *Dean*

Associate Professor,Education
Franks School of Education
B.S. (Trine University); M.S. (IUPU, Indianapolis); Ph.D. (Central Michigan University)

Amy Tracey (2024)
Assistant Professor, Department of Criminal Justice
Jannen School of Arts & Sciences

B.S. (Sault Ste. Marie); M.B.A. (Cornerstone University); Ph.D. ABD_2025 (Liberty University)

R. Thomas Trusty (2007) *Department Chair*
Associate Professor, Department of Design Engineering Technology
Allen School of Engineering and Computing
B.S. (Purdue University); M.A. (Ball State University); M.S. (Trine University)

Timothy Tyler (1993 -1998, 1999) *John G. & Virginia C. Stemples Professor in Engineering*
Professor, Reiners Department of Civil & Environmental Engineering
Allen School of Engineering and Computing
B.S., M.S. (West Virginia University); Ph.D. (Virginia Polytechnic);
P.E. Virginia and Indiana

Anthony Vasaturo (2019)
Associate Professor, Department of Mathematics
Jannen School of Arts and Sciences
B.S., M.A., Ph.D. (University of Toledo)

Emilio Vazquez (2014) *Medical Director*
Associate Professor, Master in Physician Assistant Studies Program
Brooks College of Health Professions
B.S. (George Washington University); M.D. (University of Maryland School of Medicine)

Jamesdean Visley (2024) *Fieldwork Coordinator*
Associate Professor, Doctorate of Occupational Therapy Program
Brooks College of Health Professions
B.S. (University of Pittsburgh); D.O.T. (Huntington University)

Craig Waitt (2024)
Assistant Professor, Department of Science
Rinker-Ross School of Health Sciences
B.S., M.Sc. (Montclair State University); Ph.D. (University of Notre Dame)

Kelsey Walker (2023)
Instructor, Graduate Programs
College of Graduate and Professional Studies
B.A., M.A. (University of Akron); Ph.D. (University of North Carolina)

Jenna Waterman (2023)
Assistant Professor, Physician Assistant Studies Program
Brooks College of Health Professions
B.S. (University of Mount Union); M.P.A.S./ PA-C (Kettering College)

Emily Watkins (2019)
Associate Professor, Department of Exercise Science
Rinker-Ross School of Health Sciences
B.S. (Purdue University); D.P.T. (Trine University)

Beau Watson (2015)
Associate Professor, Bock Department of Biomedical Engineering
Allen School of Engineering & Computing
B.S., M.S.E., Ph.D. (Louisiana Tech)

Tonya Weaver (2024)
Assistant Professor, Education
Franks School of Education
B.S. (Butler University); M.S. (Indiana University-Purdue University-Fort Wayne)

Darryl Webber (2006) *Department Chair*
Professor, Wade Department of Mechanical & Aerospace Engineering
Allen School of Engineering & Computing
B.S. (Montana College of Mineral Science and Technology);
M.S. (Montana Tech of the University of Montana);
Ph.D. (Missouri University of Science & Technology)

Tricia Widenhoefer (2016)
Associate Professor, Doctorate of Physical Therapy Program
Brooks College of Health Sciences
B.A., M.S. (University of Indianapolis); D.P.T. (University of Montana)

Darrin Wilcox (2022) *Dean*
Assistant Professor, Department of Criminal Justice
Jannen School of Arts & Sciences
B.A. (University of Tennessee); M.A. (American Military University); Ph.D. (Walden University)

Kara Wilson (2024)
Assistant Professor, Physician Assistant Studies Program
Brooks College of Health Professions
B.S. (Walsh University); M.S.B.S. (University of Toledo)

Kevin Woolverton (2015)
Professor, Department of Electrical & Computer Engineering
Allen School of Engineering & Computing
B.S. (Kansas State University); M.S. (Oklahoma State University); Ph.D. (Texas Tech University)

Kimberly Wright (2014) *Faculty Athletic Representative*
Assistant Professor, Department of Psychology & Social Sciences
Jannen School of Arts & Sciences
B.A. (Miami University); M.A. (Bowling Green State University)

Donna Wyse (2016) *Department Chair*
Assistant Professor, Department of Psychology & Social Sciences
Jannen School of Arts & Sciences
B.S. (Defiance College); M.S. (Capella University)

Wendy Yagodinski (2020) *Department Chair*
Assistant Professor, Department of Computer and Information Systems
Allen School of Engineering & Computing
B.S. M.S. (Trine University)

Godfred Yamoah (2016)
Associate Professor, Department of Mathematics and Actuarial Science
Jannen School of Arts & Sciences
B.S., M.S. (University of Lagos); Ph.D. (Clarkson University)

Henry Yukevich (2021)
Assistant Professor, Department of Humanities & Communication
Jannen School of Arts & Sciences

B.A. (Grove City College); M.A. (University of Dayton), Ph.D. (Indiana University of Pennsylvania)

Sarah Zimmer (2016)
Associate Professor, Department of Humanities & Communication
Jannen School of Arts & Sciences
B.A., (Columbia College); M.F.A. (Cranbrook Academy of Art)

Christina Zumbrun (2006)
Professor, Department of Mathematics
Jannen School of Arts & Sciences
B.B.S. (Hardin-Simmons University); M.S. (Purdue University);
Ph.D. (Western Michigan University)

# Faculty and Administration Emeriti

Susan Anspaugh (2005) Professor Emeritus, 2020, Exercise Science

Brett Batson (2006) Professor Emeritus, 2020, Mechanical Engineering

Jerry Beehler (1969) Professor Emeritus, 2005; Mathematics

Ann Benson (1985) Professor Emeritus, 2018; Science

John Berger (1983) Professor Emeritus, 1994; Business Administration

Michael Biegas (2003) Professor Emeritus, 2023; Social Sciences

Michael Blaz, (1976) Professor Emeritus, 2023 Psychology

Jean Deller (1989) Professor Emeritus 2018; Education

Satish Goyal (1979) Professor Emeritus, 1987; Civil Engineering

Karen Hamilton (2007) Professor Emeritus, 2016; Education

Roger Hawks (1977) Professor Emeritus, 2009; Mechanical & Aerospace Engineering

Debra Helmsing (1983) Registrar Emeritus, 2022

William W. Hill (1961) Professor Emeritus, 1993; Mechanical & Aerospace Engineering

Peter Hippensteel (1964) Professor Emeritus, 2005; Biology

Joan Karbach (1994) Professor Emeritus, 2006; English

Leo F. Kuhn (1961) Professor Emeritus, 1992; Engineering Graphics

Sushil Kumar (1981) Professor Emeritus, 2005; Civil & Environmental Engineering

Richard Kruger (1965) Associate Professor Emeritus, 2006; Mathematics

Donald Jones (1996) Professor Emeritus, 2019; Communication

Ira Jones (1983) Professor Emeritus, 2023; Science

Michael J. Lesiak (1967) Associate Professor Emeritus, 2004; Accounting

William Lipman (2000) Associate Professor Emeritus, 2012, Business & Finance

William Maddock (1998) Professor Emeritus, 2019; Sport Management

Dan Matthews (1983) Professor Emeritus, 2020; Informatics

Kenneth Meeks (1997-2008) Professor Emeritus, 2008; Civil Engineering

John Milliken (2004) Professor Emeritus, 2022; Criminal Justice

Gerald Moore (1968) Professor Emeritus, 1998; Social Sciences

Edward Nagle (1967) Professor Emeritus 2008; Department of Technology

Aldo R. Neyman (1986) Professor Emeritus, 1999; Business Administration

Dennis Petrie (1975) Professor Emeritus, 2010; Language & Humanities

Chester A. Pinkham (1967) Professor Emeritus, 2002; Chemistry

R. John Reynolds (1993) President Emeritus, 2000

Richard A. Ruselink (1966) Associate Professor Emeritus, 2004; Mathematics

Majid Salim (1984) Professor Emeritus, 2019; Chemical Engineering

Jeanine Samuelson (1986) Professor Emeritus, 2016; English

Lawrence Samuelson (1983) Professor Emeritus, 2010; Electrical & Computer Engineering

William R. San Giacomo (1965) Professor Emeritus, 2012; Golf Management

VK Sharma (2008) Professor Emeritus, 2015; Engineering

Sally Simpson (1995) Professor Emeritus, 2014; Education

Frank Swenson (1982) Professor Emeritus, 1998; Mechanical Engineering

Thomas "Toby" Swick (2012) Professor Emeritus, 2021; Business

David Syler (1968) Professor Emeritus, 2009; Mathematics

Dolores Tichenor (1967) Professor Emeritus, 2010; Mathematics

Thomas Tierney (1974) Professor Emeritus, 2013; Language & Humanities

Debra VanRie (1991) Professor Emeritus, 2019; Mathematics

Suzanne Van Wagner (1983) Professor Emeritus, 2012; Education

John Wagner (1994) Professor Emeritus, 2024; Chemical Engineering

William J. Walter (1972) Professor Emeritus, 1993; Business Administration

Kathie Wentworth (1993) Professor Emeritus, 2018; Academic Support Services

Robert Whelchel (1969-72, 1974) Professor Emeritus, 2008; Electrical & Computer Engineering

James Zimmerman (1973) Professor Emeritus, 2005; Arts & Sciences

# Index