

Dear Future Trine Graduate,

Welcome to the Trine University family, where we are putting you into motion to revolutionize the 21<sup>st</sup> century. We have taught generations of successful learners and plan to do so for years to come. With an educational heritage spanning 128 years, we will hold you to the same rigorous academic standards we have set for those who came before you.

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. Our job-placement numbers speak for themselves. In 2013, 97 percent of our graduates were enrolled in graduate school or found meaningful employment within six months of graduation. We expect those numbers to be even higher for our 2014 graduates, many of whom received multiple job offers before graduation at starting salaries above the national average. Several of our graduates went on to pursue doctorates at schools such as Yale, Stanford, University of Michigan and Case Western, to name a few.

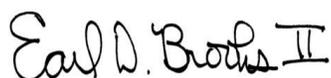
In the last decade we have experienced some of the most substantial changes than any other time in our history. The changes will continue because of the vision of our administration, faculty, staff, trustees, community and – most importantly – **you**. We are focusing on your future. You are our most valuable asset and, quite frankly, the reason we're here.

Your professors will expect active participation, collaboration, theoretical study and creativity. Not only will you learn how to do, you'll learn what to do. We are giving you the tools – quality teaching, labs, resources, technology, support – to be successful in your college career. 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 send you out into the 21<sup>st</sup> century, help you reach your goals and impact the world.

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

Sincerely,

A handwritten signature in black ink that reads "Earl D. Brooks II". The signature is written in a cursive, slightly slanted style.

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

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## **TRINE UNIVERSITY PROFILE**

### **DESCRIPTION**

Trine University is a private, comprehensive, career-oriented, degree granting institution. It offers degrees in over 35 academic programs through six schools—Allen School of Engineering & Technology, Franks School of Education, Jannen School of Arts & Sciences, Ketner School of Business, School of Health Sciences, and the School of Professional Studies. 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.

### **GOALS**

- I. **Academics:** Trine University will provide high quality academic programs, actively develop new academic programs and academic experiences, and develop additional program delivery methods that fulfill the university's mission and academic goals, and prepare students for a career or for additional education.
- II. **Facilities:** Trine University facilities (buildings and properties) will be "state of the art" and will assist in recruitment and retention of high quality students, faculty, and staff. Trine will utilize its facilities to increase the visibility for the university in the region as a major cultural, athletic, and educational center.
- III. **Enrollment:** Trine University will increase its total enrollment in all academic programs at all campuses while retaining its character as a university that recognizes the value of small classes, the need for innovative delivery methods, and the importance of a vibrant residential community.
- IV. **Finances:** Trine University will ensure responsible stewardship of its fiscal and physical resources while expanding its support resource base.
- V. **Student Services:** Trine University will provide outstanding services and support to all students in a safe environment for student engagement and learning, and provide opportunities that promote leadership, academic growth, and professional development.
- VI. **Technology:** Trine University will equip its various campuses and classrooms with state-of-the-art technology as well as the resources and support needed to enhance enrollment, retention of students and faculty, and support for all curricula.

Adopted on May 7, 1999 and revised April 30, 2004, September 2006, and October 2010 by the Board of Trustees

## ACCREDITATION

Trine University is accredited by the **Higher Learning Commission of the North Central Association of Colleges and Schools**, [www.ncahlc.org](http://www.ncahlc.org). Telephone 312.263.0456. 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**. ABET's national office is located at 111 Market Place, Suite 1050, Baltimore, Maryland, 21202-4012, USA, Telephone 410.347.7700. All teacher preparation programs are accredited by the **Council for the Accreditation of Educator Preparation** ([www.caepnet.org](http://www.caepnet.org)) and the **Department of Education/Office of Educator Licensing and Development** (DOE/OELD) ([www.doe.in.gov/licensing](http://www.doe.in.gov/licensing)). The Ketner School of Business, Bachelor of Science in Business Administration Program is accredited by the **Accreditation Council for Business Schools and Programs (ACBSP)**, [www.acbsp.org](http://www.acbsp.org). Accredited majors include: accounting, business administration, entrepreneurship, finance, golf management, management, marketing, and sport management. Associate degree programs in accounting and business administration are also accredited. \*\*\*Trine University is seeking accreditation from Accreditation Council for Business Schools and Programs (1HACBSP), [www.acbsp.org](http://www.acbsp.org), for all business programs through the School of Professional Studies.

\*\*Effective 7/29/2014, the Doctor of Physical Therapy Program at Trine University has been granted Candidate for Accreditation status by the **Commission on Accreditation in Physical Therapy Education** (1111 North Fairfax Street, Alexandria, VA, 22314; phone: 703-706-3245; email: [accreditation@apta.org](mailto:accreditation@apta.org)). Candidate for Accreditation is a pre-accreditation status of affiliation with the Commission on Accreditation in Physical Therapy Education that indicates that the program may matriculate students in technical/professional courses and that the program is progressing toward accreditation. Candidate for Accreditation is not an accreditation status nor does it assure eventual accreditation.

## 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](http://trine.edu).

## HISTORY

The University was founded in 1884 by 12 private citizens. It was and is a product of the normal school movement of that time, a fact that was reflected in its original name, Tri-State Normal College.

As a result, the mission and focus differed radically from the prevailing concepts of higher education in that day. The first schools of higher education in this country were essentially in the British mold, with emphasis on the liberal arts and training for the learned professions, particularly the clergy. By contrast, normal schools provided higher education for students in the "normal occupations" of life, such as teaching, engineering, telegraphy, domestic science and other practical arts.

Although they provided an unpretentious type of education, normal schools were generally bold and innovative. They simply took students in and encouraged them to do as much as they could

through self-development. They also encouraged active student participation in classes, as opposed to the prevailing lecture format. For the convenience of their students, the schools operated on a year-round basis. Coeducation was another striking feature of the normal school movement.

But it was the emphasis on the useful and practical, rather than the traditional, that enabled normal schools to flourish. By 1888, 30 normal schools had been founded in Indiana, including Ball State Teacher's College, Valparaiso and, of course, Tri-State Normal College, located on six acres of land in the tiny village of Angola. Within 30 years, however, Tri-State was the only school to survive as an independent; all of the other schools had perished or had become state-or church-sponsored.

One reason that Trine University succeeded while the other schools failed was because of its early leader, Littleton M. Sniff. His fierce sense of independence and total devotion to this school is documented in hundreds of letters he wrote to prospective students, assuring them they could start college regardless of their academic background and that they could earn degrees in the shortest time possible at a cost they could afford. Most of these letters concluded with the simple command and exhortation of "Come."

Sniff, the institution's second president, presided over the school's first commencement ceremonies in 1888. By May 1922, Tri-State College—renamed in 1906—had more than 200 graduates, representing nearly every state in the Union and 30 countries. Sniff died on September 14, 1922, in his 36th year as president, the longest tenure in school history. The strength of his character and the power of his convictions were part of his legacy to Trine University.

The original curricula featured teaching, bookkeeping, science, commercial law, penmanship and some courses in the classics and music. Under Sniff's guidance, the institution kept pace with the needs of the new scientific era by adding or dropping courses of study according to demand, financial feasibility and the needs of the marketplace. In 1927, the University reorganized to focus solely on its strengths in engineering and business. All other programs were discontinued, including teacher preparation, fine arts, music and the School of Law. The School of Pharmacy opened in 1902 and closed in 1922.

The School of Engineering, which was established in 1902 by George Neihous (who had come to the college at the request of President Sniff), offered accelerated bachelor of science degree programs in civil, mechanical, electrical, and chemical engineering. There was also a new engineering need to be met in the expanding world of transportation: aviation. Ever flexible and alert, Tri-State College listed aeronautical engineering as a degree program in 1929, two years after Charles Lindbergh crossed the Atlantic. During this time, the school's flying clubs—the Stick and Wing Club and the Glider Club (later renamed the Thunderbirds)—were formed. In 1934, the University celebrated its 50th anniversary at the 1934 World's Fair in Chicago with daily demonstrations of its miniature wind tunnel.

The School of Commerce, built around the objectives of the American private enterprise system, offered accelerated Bachelor of Science degree programs in business administration and accounting.

World War II could not have ended too soon for Tri-State College. By 1945 its enrollment sank to 170, putting its future in jeopardy. Several administrators had gone two years without pay. But

the war ended and more than 1,300 students—mostly GIs—swelled the campus in the fall of 1946. War surplus buildings were secured from the Federal Public Housing Agency to provide additional classroom buildings and student housing for an over-crowded campus. In 1947, due to the volume of students completing their coursework early, a mid-year commencement was instituted. With its future secure, the stockholders agreed to reorganize the 60-year-old school into a nonprofit educational corporation, marking the first time the College was granted exemption from federal tax.

Dr. Richard M. Bateman began his 15-year tenure on campus in 1960. His era would prove to be of great significance. The campus underwent one of its largest expansions in history, adding Ford Library (1962), Stewart Hall (1965), Best Hall of Sciences (1967), Hershey Hall (1970) and Zollner Golf Course (1971). Five new dormitories were constructed in 1968 as student enrollment hit a record: 2,022 students.

In 1964, as a first step in gaining accreditation with the North Central Association of Colleges and Secondary Schools (NCA), the University discontinued its accelerated 27-month programs and began enrolling students in standard 36-month programs. While many had serious misgivings about ending the accelerated programs, most realized the importance of gaining accreditation. NCA accreditation was achieved in 1966.

In 1968, the Division of Arts and Sciences was formed to offer two-year transfer programs to students who planned to earn Bachelor of Science degrees in the liberal arts at other schools. The new programs proved popular, and in 1970, the division was upgraded to a school with four-year degree programs. Teacher preparation returned to the curriculum in the 1970s. With three schools—Engineering, Business, Arts & Sciences—the institution had become more than a college. Shortly after Bateman's departure in 1975, Tri-State College was officially renamed Tri-State University.

During the 10 years leading up to its Centennial Celebration in 1984, the University continued to innovate and excel. The first Grand Prix go-kart race was held in 1971. The first International Students Association dinner was served in 1974. The first WEAX (student radio station) broadcast was heard in 1978. A free film series was inaugurated in 1980. The Trojans, known as the Engineers until 1967, had great success in golf, track and field, and particularly basketball, which collected 11 consecutive Mid-Central Conference titles and earned two appearances in the NAIA national tournament.

Tri-State University celebrated its 100th anniversary with the publishing of *From Carriage to Computer: The First 100 Years of Tri-State University*, written by Elizabeth Brown Orlosky.

In the early 1990s, the University received approval from NCA to offer adult degree programs outside of Angola. Between 1994 and 1998, the University opened four locations across northern Indiana—Angola, Fort Wayne, Merrillville and South Bend. In 2002 the Masters of Science in Engineering Technology was approved as the first graduate program. In 2014 the University offered the Doctorate of Physical Therapy as the first doctorate program for the Institution.

Hershey Hall was the site of the 1996 and 1997 NAIA Division II Women's Basketball Championship. The Tri-State University Thunder advanced to the Elite Eight in 1996. The women's golf team captured the University's first national championship in 1997. The men's volleyball team won the school's second national championship in 1998, the same year Thunder football rolled to an 11-3 record and a semi-final appearance in the national playoffs.

More than 120 years after its founding, TSU, now Trine University (2008), continues on a successful path. Since 2001, significant renovations have given the campus new life. The Keith E. Busse Athletic and Recreation Center with 200-meter indoor track and practice areas for tennis, volleyball, baseball and softball, opened 'Fall 2009'. In Fall 2010, the new Fred Zollner Athletic Stadium will serve 5,000 fans of football, lacrosse, soccer and field hockey. The renovated Sniff Building now houses the school's executive offices once again, under the name C.W. Sponsel Administration Center. The school's newest and most modern building opened on Homecoming weekend in October, 2007. The University Center and the Center for Technology and Online Resources houses the new Library and Information Resources, 320-seat Fabiani Theatre, UC Store, Student Services and Student Success and Retention offices, Mail Center, IT help desk and department, Hornbacher Fitness Center and Hornbacher Studios, the new home for WEAX 88.3-FM, Trine University's radio station.

Students moved into new apartments near the University Center and on Kinney and Moss streets in fall 2007. The apartments feature a central living area with private bedrooms and baths and kitchen area with microwave. The buildings include a central lounge with big screen TV, fireplace and small bistro area.

Trine University has completed a \$2 million technology upgrade, creating a campus-wide wireless environment. The Center for Digital Excellence, a technology classroom for group learning, is housed in the new University Center. SMART classrooms, new classrooms equipped with access to modern computers, projector systems, connectivity for laptops and additional resources for electronic instruction such as DVD players, have also been installed on the campus. The University provides more than 200 computers dedicated to student access in labs across campus. Students can also access the Internet at their convenience because every room in each apartment enjoys connectivity.

Academics remain strong in all six schools: Allen School of Engineering & Technology, Franks School of Education, Jannen School of Arts & Sciences, Ketner School of Business, School of Health Sciences, and School of Professional Studies, with graduate degree programs in criminal justice, leadership, business, and engineering, and a doctorate in physical therapy.

### **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 30 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.

**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 on the Trine University Web site (*trine.edu*). It contains statistics, policies, and a description of programs that promote campus safety as well as drug prevention program information.

## LOCATIONS

### MAIN CAMPUS

Nestled in the heart of Steuben County, Trine University's 400-acre main Angola campus serves as the hub of Trine University's various locations. Besides being home to 101 of Indiana's natural lakes, Steuben County is one of the fastest growing areas in the state. In recent years, it has been touted as one of 50 boom towns in the U.S. in Money magazine. All though the town has a population of only 9,000 residents, 750,000 visitors flock to Steuben County's scenic gem, Pokagon State Park annually. Due to the abundance of water and natural beauty, fishing, camping, skiing and boating are all popular pastimes. Angola's location at the major highway intersection of Interstate 80/90 and Interstate 69, makes it easily accessible from any of the major cities in the area. It also has a healthy economy, with 300 businesses and industries, many of which partner with Trine University to offer enhanced educational opportunities. Restaurant and shopping chains, in addition to an outlet mall in Fremont, also provide quick access to many convenient retail businesses. Additionally, a variety of family-centered activities are nearby, like putt-putt, a roller skating rink, and movie theaters. Virtually every necessity, including healthcare at Cameron Memorial Community Hospital or Urgent Care, is met on or near campus.

**The Aerospace Engineering Building** was demolished and the \$6 million, nearly 25,000-square-foot **Jim and Joan Bock Center for Innovation and Biomedical Engineering** opened in August 2013, in its place. The brick structure is home to Trine's **Innovation One (i1)**, an incubator for technology and business to help spur economic development in the region, and laboratories stocked with state-of-the-art equipment to support i1 and the Allen School of Engineering & Technology.

Named in honor of John G. Best, a distinguished alumnus and former member of the Board of Trustees, the **John G. Best Hall of Science** contains classrooms and science laboratories. The building houses the **Jannen School of Arts & Sciences**, which was named in honor of Trine University alumnus and trustee Dr. Robert L. Jannen and his wife, Dolores.

Best Hall also houses the **Fairfield Lecture Room**; the Department of Mathematics & Informatics; the Department of Science; the science laboratories; the Department of Criminal Justice, Psychology & Social Sciences; and the study abroad program.

**Forman Hall**, named after trustee emeritus Leamen Forman, trustee emeritus which includes the **Trine Welcome Center**, named to honor trustees Ralph and Sheri Trine, and the **Radcliffe Conference Room**. Dedicated in April 2001, it houses the Office of Admission, Office of Financial Aid, Office of the Registrar, Business Office, and Centennial Station Cafe.

The **Thomas L. Fawick Hall of Engineering** was named in honor of Thomas L. Fawick, an inventor, industrialist and friend of the University. Renovation on the interior of the building and the updating of all laboratories, classrooms, offices and the **Kitsuda Seminar Room** were completed in 1997. The building, which houses a scanning electron microscope, is home to the University's **Allen School of Engineering & Technology**, named for alumni Jerry and Jorja Allen. Fawick Hall also houses the **McKetta Department of Chemical & Bioprocess Engineering**, the **Wade Department of Mechanical & Aerospace Engineering**, the **Reiners Department of Civil & Environmental Engineering**, the Department of Electrical & Computer Engineering and the Department of Technology.

The chemical engineering laboratories and offices are housed in the **Howard P. Conrad Chemical Engineering Wing** of Fawick Hall, named in honor of Howard P. Conrad, distinguished industrialist and friend of the University.

The central entrance of Fawick Hall is known as the **Clifford W. Sponsel Tower** and is named to honor of Dr. Clifford W. Sponsel, an emeritus member of Trine University's Board of Trustees and a 1931 civil engineering graduate of Tri-State College.

Honoring a former chair of the Board of Trustees, the **Perry T. Ford Memorial Building** is a three-level building that houses the **Ketner School of Business**, which includes the Department of Applied Business and the Department of Management.

The **General Lewis B. Hershey Hall** athletic complex was named in honor of General Lewis B. Hershey, a distinguished alumnus, member of the Board of Trustees, and 29-year director of the U.S. Selective Service System. Hershey Hall contains offices, classrooms, the **Ketner Sports Center**, the **Gettig Fitness Center**, the **John Behee Conference Room**, racquetball courts, an indoor track and a main arena for basketball and volleyball with a seating capacity of 4,000. Hershey Hall was renovated before serving as the site of the 1996 and 1997 NAIA women's national basketball tournament.

**Platt Hall, Conrad Hall, Fabiani Hall, Cameron Hall and Alwood Hall** house students at the main campus. Parking is available near the residence halls. In 1995 and 1996, the original Alwood, Cameron and Platt residence halls were demolished. They had been named in honor of three former trustees: Ray Alwood, an accomplished Angola businessman and former vice chair of the Board of Trustees; Dr. Don Cameron, a 1905 graduate and founder of Angola's Cameron Hospital; and Dr. Henry Platt Jr., a business and industry leader in the Chicago area. On April 5, 2000, the residence halls were renamed in the trustees' honor. On May 4, 2000, Conrad Hall was dedicated to honor the memory of Mr. Howard P. and Dr. Martha Conrad, both past presidents of Northern Indiana Fuel & Light Co. Dr. Martha Conrad was also a former member of the Board of Trustees. Fabiani Hall was named in honor of Dr. Dante C. Fabiani, a 1938 graduate and former chair of the Board of Trustees. His son, James P. Fabiani, is currently a member of the Board of Trustees.

Named in honor of Jack F. Ealy, a 1927 electrical engineering graduate, the **Ealy International Center** was dedicated in the summer of 1996. It is located on the lower level of Conrad Hall and houses, the Health Center, Textbook Annex, and Campus Safety.

From 1905 to 1970, **William D. Shambaugh Hall** was known first as the Engineering Building and later as the Recitation Building, which housed the classrooms for basic subjects. The building was renovated in 1988-89 and was named in honor of William D. Shambaugh, a distinguished alumnus. It now houses the **Franks School of Education**, the namesake of long-standing trustee Lawrence Franks. The **Mary Mogish Kostyshak Educational Media Resource Center** is also located in the Building. The center offers a juvenile literature and school curriculum collection, kits and audio-visual resource materials as well as workspace and materials to support education students. Named in honor of Paul and Mary Mogish Kostyshak, Paul Kostyshak was a 1949 Tri-State College civil engineering graduate. Shambaugh Hall also houses the Department of Exercise Science, and People Services.

Built in 1887, the **Littleton M. Sniff Administration Building** is the second- oldest building on campus. It was named in honor of the second president of Tri-State College, Littleton M. Sniff. In

2004, a multi-year, \$2 million renovation began, which included renaming the building the **C.W. Sponsel Administration Center**. The addition of a carillon in the bell tower of the building was a gift from current trustee and alumnus William Gettig. The bell chimes on the quarter hour and plays, among other tunes, the University alma mater.

The oldest building on campus was completed in 1884 and received a complete renovation in 1992. It was named in honor of 1936 mechanical engineering graduate Dr. Charles Taylor, a Trine University Trustee since 1992, and his wife, Nancy. The **Charles and Nancy Taylor Hall of Humanities** houses the Department of Humanities & Communication as well as classrooms, the **Wells Gallery**, the Humanities Institute, the Fine Arts Library, and the **Wells Theater**, the home of the University's drama club.

The 18-hole **Zollner Golf Course** offers scenic recreation with its renovated bunkers and many challenging holes. The golf course is named in honor of Fred Zollner, a prominent industrialist and former chair of the University Board of Trustees. In 1999, the **Witmer Clubhouse** was named for Wilber E. Witmer, a 1947 business administration graduate and golf course benefactor.

**SCHOOL OF PROFESSIONAL STUDIES**

The School of Professional Studies 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. Nearly one-fourth of all students attending Trine University are School of Professional Studies' students.

**SCHOOL OF PROFESSIONAL STUDIES****Angola Education Center**

One University Ave.  
Angola, IN 46703  
[angola@trine.edu](mailto:angola@trine.edu)

**Columbus Education Center**

4475 Central Avenue  
Columbus, IN 47203  
[Columbus@trine.edu](mailto:Columbus@trine.edu)

**Fort Wayne Regional Campus**

9910 DuPont Circle Drive East, Suite 130  
Fort Wayne, IN 46825  
[fortwayne@trine.edu](mailto:fortwayne@trine.edu)

**Indianapolis Regional Educational Center**

7508 Beechwood Centre Road  
Avon, IN 46123  
[avon@trine.edu](mailto:avon@trine.edu)

**Logansport Educational Center**

2815 E. Market St.  
Logansport, IN 46947

**South Bend Regional Campus**

4101 Edison Lakes Parkway, Suite 250  
Mishawaka, IN 46545  
[southbend@trine.edu](mailto:southbend@trine.edu)

**Sturgis Educational Center**

107 W. West Street  
Sturgis, MI 49091

**Warsaw Education Center**

907 Wooster Road  
Winona Lake, Indiana 46590

**TRINE UNIVERSITY ADDITIONAL LOCATIONS**

**Carew Education Center**

1819 Carew St.

Ft. Wayne, IN 260-203-2914

E-mail: [DPT@trine.edu](mailto:DPT@trine.edu)

**Peoria, Arizona**

14100 N. 83<sup>rd</sup> Ave.

Peoria, Arizona 480.209.3549

E-mail: [www.trine.edu/peoria](http://www.trine.edu/peoria)

## **UNDERGRADUATE 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 or a regional education center in their area. An admission counselor/enrollment specialist 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 or a regional education center. 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](mailto:admit@trine.edu) or contact information for each regional site may be found at [www.trine.edu](http://www.trine.edu).

Trine University accepts an online application only. It can be accessed via the Internet at [trine.edu](http://trine.edu). Online applications may be sent by following the directions given on our Web site. No application fee is required.

### **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.

### **ENGINEERING, MATHEMATICS, FORENSIC SCIENCE, AND COMPUTER SCIENCE APPLICANTS**

In addition to the above, all prospective engineering, mathematics, forensic science, and computer science majors should at a minimum have completed two years of algebra, one year of geometry, and a semester of trigonometry.

### **ENGINEERING APPLICANTS**

Prospective engineering majors should have completed one year each of chemistry and physics.

### **PREPARATORY COURSES**

Every Trine University academic program has a mathematics component. Faculty advisors recommend a beginning mathematics course based upon a student's SAT and/or ACT exam results and high school GPA. If adequate information regarding a student's math skills is not available, a student may be required to take a mathematics placement exam. A student may be assigned to non-credit, preparatory courses in mathematics.

### **SPS Students**

Results from the American College Aptitude Test (ACT) or the Scholastic Aptitude Test (SAT) are not required for the School of Professional Studies student.

### **GENERAL APPLICATION PROCEDURES AND REQUIREMENTS**

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

- Evidence of graduation from an accredited high school or an acceptable score on the General Education Development (GED) examination.
- Official high school transcripts must be sent from the originating high schools or official documentation from GED provided directly to the Office of Admissions or Enrollment Specialist of the education center they plan to attend.

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Transfer students must request official transcripts from all post-secondary schools they attended, official transcripts must be sent directly to the Office of Admission or the Enrollment Specialist of the education center they plan to attend.

Results from the American College Aptitude Test (ACT) or the Scholastic Aptitude Test (SAT) are required unless the applicant has been out of high school for five years or more.

### **SPS Students**

Results from the American College Aptitude Test (ACT) or the Scholastic Aptitude Test (SAT) are not required for the School of Professional Studies student.

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.

### **NON-DEGREE SENIOR CITIZENS**

Trine University offers free tuition for persons 60 years of age or older who are served by the Steuben County Council on Aging and who reside in Steuben County to take undergraduate courses for credit and/or non-credit. Enrollment is granted on a space-availability basis.

### **HOUSING INFORMATION**

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, see the [“Student Services”](#) section of the catalog, or review the “Student Services” section on the web at [www.trine.edu](http://www.trine.edu).

### **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 course work 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 are awarded subject to the approval of the Office of the Registrar.

### **PRIOR LEARNING POLICY**

#### **Rationale:**

Recognizing that non-traditional students can bring to their educational process a wealth of college level knowledge gained from experiences and accomplishments outside the normal college setting, Trine University will offer students transfer credits toward their degree programs from alternative activities.

Students may be able to earn a maximum of 90 credits toward a Bachelor degree based on previous academic study through transfer credit from other regionally accredited college(s) or university(s), standardized examination programs such as the College Level Examination

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Program (CLEP), the Defense Activity of Non-Traditional Education Support (DANTES) using the credit recommendations of the American Council of Education or examination by an academic department of Trine University. Students may also use alternative learning sources such as of employment, military, and evaluation of a Prior Learning Portfolio to determine life experience credits.

Trine University's general policies for awarding credit for alternative learning follow:

1. Prior Learning credits are considered transfer credits and are subject to the same policies as other transfer credits. A maximum of 90 semester credit hours from a regionally accredited college or university and extra-institutional sources may be applied toward the minimum 120 hours required for a Bachelor's degree.
2. Individuals who have not participated in similarly scheduled course work are eligible to receive life experience credit.
3. Credit by examination may be earned only once in a single subject. A similar subject test in another testing program will not earn additional credits.
4. Credit may be granted for specific courses and electives based on prior learning as defined by particular requirements within individual degree programs. The maximum allowable amount of life experience and training credit for specific courses and electives is 60 credit hours.
5. Credits applied toward a degree may include hours earned by means of alternative activities such as credit by examination (30 hours maximum) and credit for life experience and training (60 hours maximum).
6. Life experience and training credit may be earned only for documented data to support knowledge, application, and implementation of degree related competencies and is not granted simply for experience.
7. Classroom-based corporate or military learning experiences are evaluated for college credit equivalency based upon recommendations of the American Council on Education or other nationally recognized organizations.
8. There are no costs or fees associated with any transfer credit or prior learning evaluations.

### **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 test approved by American Council on Education and Trine University examinations by department.

### **Credits for Life Experiences**

Prior Learning credits are evaluated based upon the required and elective courses from specific degree programs. The process for evaluating a person's life experience is similar to evaluation of coursework transferred from other colleges or universities. The evaluator

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awards credit where appropriate and student receives a curriculum guide indicating exactly which courses must be completed for graduation.

### **Prior Learning Requirements Defined**

1. Students requesting credit for training are required to complete a Request for Academic Credit and submit a Technical and Professional Training worksheet demonstrating learning attained through workshops, seminars or other training experiences not specifically reviewed by recognized evaluation organizations. Additional documentation or restructuring of student's petition may be requested before awarding credit.
2. Students requesting credit for life experience are required to complete a Request for Academic Credit and submit a Prior Learning Portfolio (description below).
  - a. Student demonstrates how the outcomes of experiential learning are similar to those of a particular course or are equivalent to a degree related elective.
3. Official transcripts for courses from other institutions, military transcripts and official score reports are required. Transcripts and score reports will be evaluated to determine which credits will transfer to the University and fulfill the requirements of the student's chosen degree program. Evaluation of credit for prior learning is based on a student's major and will be reevaluated in the event a student changes major. Credit previously granted may change for a student who changes major.

### **Technical and Professional Training Worksheet**

- Complete Technical and Professional Training Worksheet (attached) to verify learning attained through workshops, seminars, continuing education courses or training experiences. Student must attach documentation showing hours completed.

### **Prior Learning Portfolio (PLP)**

#### **Documentation required**

- Resume and HR documentation
- Autobiography of 1-2 pages
- Creation of Active Learning Statements ( See Outline Attached)
- Letters from current and past employers verifying job responsibilities and/or information
- Copies of newspaper articles, special awards received and letters of recommendation
- Samples of writing and/or computer skills including letters, brochures and programs
- Photocopies of licenses and certificates of complete for non-credit work

Description of Documents Required:

#### **Resume and HR file information:**

- Professional Resume documenting student's career
- 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

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evaluations will be copies of the originals kept by the employer and must show signatures to be considered as proof of performance.

#### **Autobiography:**

- 1 - 2 page document that allows the student to share their personal story.

#### **Active Learning Statements:**

- Write a professional detailed summary of each position to be considered for college level credits toward a specific course or a degree related elective. Follow the outline attached for every position submitted for evaluation.

## **AWARDING OF CREDIT BY EXAMINATION**

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### ADVANCED PLACEMENT (AP) EXAMINATION

An applicant for freshman standing 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. Students who score 5 on an exam should contact the appropriate department chair for consideration of additional credit:

<b>AP EXAMINATION</b>	<b>TRINE UNIVERSITY CREDIT</b>
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Art

History	3 sem. hrs. Humanities electives
Studio	3 sem. hrs. Humanities electives
Drawing	3 sem. hrs. Humanities electives

Biology

Biology	BIO 114
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Chemistry

Chemistry	CH 104
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Computer Science

Computer Science	3 sem. hrs. Informatics electives
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Economics

Macroeconomics	ECO 223
Microeconomics	ECO 213

English

Language & Composition	ENG 103, 113
Literature & Composition	ENG 103, 153

French

Language	3 sem. hrs. Humanities electives
Literature	3 sem. hrs. Humanities electives

German

German	3 sem. hrs. Humanities electives
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Government & Politics

Government & Politics	GOV 113
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History

American	HIS 103, 113
European	HIS 203, 213

Latin

Virgil	3 sem. hrs. Humanities electives
Catullus-Horace	3 sem. hrs. Humanities electives

Mathematics

Calculus AB	MA 134
Calculus BC	If a student has a score of 4 or 5, credit will be given in MA 134 and MA 164. A score lower than 4 on the BC Exam may earn credit in

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MA 134 depending upon the AB subscore.

Statistics	MA 253
Music	
Music	3 sem. hrs. Humanities electives
Physics	
Physics B	PH 104
Physics C	PH 224
Psychology	
Psychology	PSY 113
Spanish	
Language	SPN 113, 123
Literature	SPN 113, 123

### **CLEP AND DANTES TESTING**

Trine University awards credits based upon the College Level Examination Program's (CLEP) general and subject-matter examinations as well as all DANTES examinations. Trine University is not a testing site for either examination program. For information regarding CLEP or DANTES credits, contact the Office of the Registrar.

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 or DANTES credit will be listed on the student's transcript for the number of semester hours recommended in the official CLEP or DANTES publications. The student's department chair will determine whether the CLEP or DANTES credit received will apply toward a portion of the requirements in the University's general education requirements, school requirements, major requirements or electives.

### **PROJECT LEAD THE WAY TUITION SCHOLARSHIPS**

- 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 two 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 minimum of (2) 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.

### **TRINE UNIVERSITY/PROJECT LEAD THE WAY CREDIT**

Course Equivalency:

- PLTW Introduction to Engineering Design equivalent to Trine University Basic Technical Drawing (ETD 103)
- PLTW Computer Integrated Manufacturing equivalent to Trine University Manufacturing Materials & Processes (ETD 123)

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- PLTW Engineering Design & Development equivalent to Trine University Dual Enrollment designation (GE 113 or substitution/free elective for an introductory course to individual engineering degree programs)

### **UNIVERSITY CREDIT BY EXAM**

A student may earn credit by taking an examination for approved courses administered by the appropriate academic department. A list of courses for credit by examination is available in departmental offices. A fee is assessed, and application forms are available in the Office of the Registrar.

### **DUAL ENROLLMENT (Dual Credit Program for High School Students)**

Through the Dual Enrollment, 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), successfully completed the sophomore year of high school, 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).

All Dual Enrollment students must sign enrollment forms which 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 [www.trine.edu/middlecollege](http://www.trine.edu/middlecollege) or by calling the Dual Enrollment office at 260.665.4648.

### **TRANSFER STUDENT ADMISSION (MAIN CAMPUS)**

A transfer student follows Trine University's general application admission procedures. Students are eligible for admission only from approved schools of higher learning, and cannot be on academic probation from the previous institution(s).

A student who does not meet Trine University's academic standards for freshman admission may apply as a transfer applicant once he/she has completed a minimum of 18 semester credit hours/or 27 quarter credit hours within a two semester/or three quarter period at a

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community or junior college or other 4-year institution. These 18 semester/or 27 quarter credits must include English Composition I, a mathematics course, and a social science or humanities elective. Developmental or preparatory classes are not to be included in this total. The student must earn a grade of “C” or better in each of these required courses and have a minimum grade point average of 2.0.

Transfer students applying to the School of Engineering must have a cumulative grade point average of 2.5 and a grade of “C” or better in Calculus I, Chemistry I, and English Composition I.

Trine University encourages applications from community college graduates. Transfer relationships facilitate the application process and offer special benefits with the following two and four-year institutions:

Bethel College, Mishawaka, IN  
Genessee Community College, Batavia, NY  
Glen Oaks Community College, Centreville, MI  
Ivy Tech Community College, IN  
Jackson Community College, Jackson, MI  
Joliet Junior College, Joliet, IL  
Kellogg Community College, Battle Creek and Coldwater, MI  
Lansing Community College, Lansing, MI  
Lorain Community College, Elyria, OH  
Northwest State Community College, Archbold, OH  
Owens Community College, Toledo, OH  
Southwestern Michigan College, Dowagiac, MI  
Vincennes University, Terre Haute, IN

Graduates of two-year programs in applied science should anticipate a minimum of six semesters to complete a bachelor’s degree in engineering. Trine University offers a number of “two-plus-two” degree program options, including design engineering technology and selected business programs.

Trine University offers transfer scholarships to qualified full-time, main campus applicants.

### **TRANSFER STUDENT ADMISSION (SCHOOL OF PROFESSIONAL STUDIES)**

A transfer student follows Trine University’s general application admission procedures. Students are eligible for admission only from approved schools of higher learning, and cannot be on academic probation from the previous institution(s). The applicant must have a satisfactory academic record at the previous institution(s) of higher learning.

Trine University encourages applications from community college graduates. It has transfer relationships that facilitate the application process and offer special benefits with the following two- and four-year institutions:

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- Bethel College, Mishawaka, IN
- Genesee Community College, Batavia, NY
- Glen Oaks Community College, Centreville, MI
- Harrison College, all Indiana locations
- Ivy Tech Community College, all Indiana locations
- Jackson Community College, Jackson, MI
- Joliet Junior College, Joliet, IL
- Kellogg Community College, Battle Creek and Coldwater, MI
- Lansing Community College, Lansing, MI
- Lorain Community College, Elyria, OH
- Northwest State Community College, Archbold, OH
- Owens Community College, Toledo, OH
- Southwestern Michigan College, Dowagiac, MI
- Vincennes University, Terre Haute, IN

### **TRANSFER CREDIT**

Credits earned at an approved institution with grades of “C” or better may be transferred to Trine University. Credits acceptable toward a Trine University degree shall be determined by the department in which the student is enrolled. An evaluation of transfer credit shall be made when the University receives an official transcript of the completed course work. 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.

### **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

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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**

Students must demonstrate proficiency in English by providing a TOEFL score (code is 1811), ACT (code is 1250), or SAT (code is 1811). A minimum TOEFL score of 530 is required on the paper test, or 71 on the iBT, or a 6.0 overall score IELTS.

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

### **ENGLISH AS A SECOND LANGUAGE PROGRAM (ESL)**

Students who do not meet the English language proficiency requirement for admission directly into a University degree program may apply for admission to the English as a Second Language program with “conditional admission” to a University degree program.

The intensive ESL program strives to prepare non-native English speaking students with the academic, cultural, and social language skills needed for success in an American university setting and in everyday life in the United States. It offers a variety of classes to non-native English speakers who need to improve their English language skills before entering their academic field of study. Students who score below minimum requirements on the IELTS or TOEFL and those who do not have a TOEFL or IELTS score are placed in the appropriate level of English Language proficiency based on the results of an ESL placement test taken upon their arrival to the university.

The English as a Second Language Program at Trine University offers non-credit intensive English language courses to highly motivated international students whose native language is not English. The ESL program is designed to help equip students with the skills necessary to read, write, speak, and understand American English, so they can successfully complete college-level courses. Students will be tested at the end of the first semester of the ESL program and may need to continue taking intensive English preparation courses either full-time or part-time in combination with regular college courses as recommended by the Director of the ESL program. Students may begin their full-time degree program after successful completion of the ESL program.

### **READMISSION (MAIN CAMPUS)**

A student whose enrollment is interrupted for any reason for more than one semester, not including the summer semester, is considered to have withdrawn and must be readmitted. Candidates for readmission must make application through the Registrar’s Office.

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). This program provides the student with on-campus benefits during the period of the leave. Application materials are available in the Registrar’s Office.

### **READMISSION (SCHOOL OF PROFESSIONAL STUDIES )**

A student whose enrollment is interrupted for any reason for more than two consecutive eight-week terms, not including summer, is considered to have withdrawn and must be readmitted. Candidates for readmission must complete a readmission application through the enrollment specialist of the educational center where the student intends to enroll.

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Any student dismissed for academic or other disciplinary reasons must make application through the Enrollment Specialist for readmission and receive the approval from university's readmit committee before being allowed to enroll in classes.

## **TUITION AND FEES**

### **PAYMENT OF EDUCATION 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

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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.

### **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.

### **CREDIT BY EXAMINATION**

A fee per credit hour must be paid in advance to the Business Office for a school or department-administered examination for credit. To learn the amount of this fee, call the Business Office.

### **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. The \$300 Enrollment Deposit is not refundable and must be submitted no later than 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.

### **OTHER DISCOUNTS**

Students who qualify for other discounted tuition must maintain a minimum 2.0 while as a Trine student in order to be eligible for the discounted tuition.

### **FLAT RATE TUITION**

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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.

### **INTERNATIONAL FEE**

All entering international students are assessed a one-time non-refundable fee of \$650 upon enrollment for an orientation program and specialized programs and services. A portion of the fee (\$150) will be used as a housing deposit.

### **STUDENT FEE**

A fee is charged for all full time students.

### **TRANSCRIPT FEE**

A per copy fee is assessed for issuance of official Trine University transcripts. A transcript will not be issued to a student with an outstanding financial obligation to the University.

### **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.

#### **SCHOOL OF PROFESSIONAL STUDIES 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. 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. Books ordered online or by phone will be mailed directly to the student. Students are encouraged to utilize e-Books which may be downloaded to their laptops at approximately one half the cost of a traditional textbook.

#### **SCHOOL OF PROFESSIONAL STUDIES LAPTOP COMPUTER / TABLET REQUIREMENT**

All new students admitted to the School of Professional Studies (SPS) are required to have or purchase a laptop computer or tablet that meets the SPS minimum specifications before attending their first class.

All SPS student laptops must (at a minimum) have the following specifications:

- Windows XP, Vista, or Windows 7 Operating System or Newer
- 2GHz Processor or Larger
- 1GB RAM or Larger
- 200MB Hard Drive or Larger
- Optical Drive
- Webcam
- Microsoft Office 2010
- 802.11 Wireless G or N Capable

To assist students, all branch campuses have available wireless internet access.

It is recommended that SPS students contact the Trine University Bookstore to purchase a laptop or tablet that meets SPS requirements. SPS students who qualify may be able to use

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financial aid money to purchase the laptop or tablet through the university bookstore. Students should contact the financial aid office for specific requirements and eligibility.

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.

### **MISCELLANEOUS FEES**

A student is responsible for any additional fees such as library fines, parking tickets, and lab 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 increase 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 dry cleaning, 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, computers, printers, stereo equipment, microwaves, refrigerators, etc. All damage or loss incurred to a student’s personal property is solely the responsibility of the student. This damage and/or loss can be caused by, but is not limited to, theft, power outages, power surges, etc. It is recommended that all students verify that their personal property is covered by their parents’ homeowners 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.

### **TELEPHONE SERVICE**

Trine University students must provide their own telephone.

### **REFUNDS (MAIN CAMPUS)**

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

Tuition:

Week One—100%;

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Weeks Two & Three—50%;

Week Four—0%

Room and Board:

Week One—Prorated at \$50/day;

Weeks Two & Three—50%;

Week Four—0%

A \$50 administration fee will be assessed for “exception” drops (per occurrence).

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.

### **REFUNDS (SCHOOL OF 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%

A \$50 administration fee will be assessed for “exception” drops (per occurrence).

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.

The official withdrawal form is required for a refund to be processed.

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.

### **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.

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- 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.

#### **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 on the Trine University Web site (*trine.edu*).

## **FINANCIAL AID**

#### **PURPOSE**

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.

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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 electronic mail.

The Office of Financial Aid is located in Forman Hall, and has a street address of Office of Financial Aid, 1 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](mailto:finaid@trine.edu), and accepts faxed documents at 260.665.4511.

### **OFFICE OF FINANCIAL AID**

The Financial Aid staff recognizes that many students need financial assistance to help fund their educational goals. The mission of the Trine University Financial Aid Office is service-oriented and geared to providing access, choice, and education for interested students. To accomplish its mission, Trine University offers a variety of financial counseling and planning programs for students with economic need.

The information listed in this section is some key highlights. 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 877.294.4878.

### **Please be aware of the following general financial aid policies:**

#### **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 FAFSA at [www.fafsa.gov](http://www.fafsa.gov) with school code 001839.

The FAFSA (Free Application for Federal Student Aid) for new applicants or returning applicants is the primary application for assistance. This can be filed on line at [www.fafsa.gov](http://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 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.

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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) and 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 3 areas that are evaluated after the end of each academic term; number of credit hours passed, cumulative grade point average 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 grade level. Once a student accepts the loan there are 3 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 (6) credit hours to qualify for Federal Student Loans.

### **AWARDING**

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 by the financial aid committee, and the Director 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 with a postcard or an email being sent to the student as soon as the FAFSA is received.

Assistance derived from 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.

### **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 4 year) 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 4 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 21<sup>st</sup>

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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](http://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

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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 fulltime 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 [www.trine.edu](http://www.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

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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

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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**

A housing survey and residential room and board contract are available through MyPortal, and will not be processed until after a formal offer of admission has been extended by the Office of Admission and the Enrollment Deposit has been paid. Former students may submit housing applications upon readmission.

### **HOUSING REQUIREMENTS**

Trine University students enrolled prior to fall 2009: All students are obligated to live on campus until he/she has completed 48 hours and has lived on campus for four semesters. Students who are married, responsible for a dependent child, living at home with a parent or legal guardian (within 40 miles of Angola), or are 21 years of age on or before the first day of fall classes may be waived from the 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 40 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 48 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 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. For those students with an on-campus portion of the Trine University Merit Scholarship it will be withdrawn once the student is no longer an on-campus residential student. The academic merit portion will remain. The student is eligible for other types of financial assistance, and as always it is recommended that the student continue to complete the FAFSA by the March 10th institutional deadline.

### **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

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juniors and seniors, and are assigned based on combined academics and social standing. A select group of students are eligible to be housed in Moyer Apartments on the golf course.

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.

### **DISCIPLINARY STRUCTURE**

Learning to live as productive members of a university community is a developmental process that starts as a freshman and continues throughout the college experience. The primary goals of educational discipline are to educate students in the understanding of community and to help them assume and demonstrate responsibility as a member of a civilized society. The primary principle upon which the disciplinary program is based is that actions have consequences. Educational discipline is different from law enforcement. The goal is education and restoration. For that reason, the Office of Student Services operates within a different realm and makes decisions differently than those agencies that enforce public law.

Attending Trine University is an optional and voluntary action. Institutional acceptance for attendance extends an invitation to students to join an academic and social community and to remain a member of that community as long as academic, community and residential standards are met. The standards and procedures of Trine University have been established to ensure the educational purpose of the university will be met and an atmosphere of intellectual growth exists. Any person may file a complaint, with the Campus Safety or the Office of Student Services, against another student, a member of the University community, or a student organization for the violation of community or residential standards as outlined in this Student Handbook. Students are expected to abide by the standards set forth in this Student Handbook. Failure to do so may result in disciplinary sanctions.

### **PROCESS:**

The disciplinary system at Trine University consists of a Judicial Review Committee, Judicial Review Board, Dean of Students, and the University Disciplinary Review Board. Disciplinary issues may be handled by one or more of the above groups depending on the severity of the offense. The Judicial Review Committee shall determine which group will hear the individual case(s). The University Disciplinary Review Board will hear cases involving potential dismissal or expulsion. In addition, for serious offenses, acts, or crimes against

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other people or the university are grounds for being placed on Final Notice or immediate dismissal by the Dean of Students.

The Judicial System at Trine University is operating under a standardized point system. Points are assigned depending on the severity of the violation. Points are accumulated for the duration of time spent at Trine University.

### **WARNING**

Disciplinary Warning is an official sanction notifying the student or organization that certain behavior was unacceptable. Further misconduct may result in additional disciplinary sanctions.

### **INTERVENTION: 1 – 74 judicial points**

Disciplinary Intervention is an official sanction indicating to a student or organization that their behavior was unacceptable. Disciplinary sanctions will be imposed.

### **FINAL NOTICE: 75 judicial points**

When on Final Notice, a student or organization will meet with the Dean of Students and a disciplinary action plan will be presented by the student or organization. Final notice is an official sanction notifying the student or organization that any additional inappropriate behavior will result in a referral to the University Disciplinary Review Board with a recommendation of possible dismissal from Trine University.

### **UNIVERSITY DISCIPLINARY REVIEW BOARD REFERRAL: 80 judicial points**

University Disciplinary Review Board Referral is an official sanction notifying the student that his or her behavior has resulted in a referral to the University Disciplinary Review Board and a recommendation of possible dismissal from Trine University.

**Disciplinary Dismissal** is an official determination canceling the student's registration at the university. In the instance of dismissal, all academic grades will revert to "F's" and monetary reimbursements may not be made for tuition, room and board, or any other university fees. Students who wish to return to the university at a later date must submit a written request to return to the Registrar and Dean of Students. Notification will be sent to appropriate university offices when a student is dismissed. The student's parents or guardians will also be notified.

### **DISCIPLINARY SANCTIONS**

Sanctions for misconduct may include, but not limited to fines, loss of privilege or participation in any university activities, sports, academic organizations, or trips for a set period of time, restitution, university service hours, educational/service activities, dismissal, and/or expulsion.

### **JUDICIAL REVIEW MEETING**

During the judicial review meeting, the Judicial Review Committee will meet with the student to review the charge(s). During this review, the case will be presented to the student and a decision regarding actions and sanctions will be determined. If the student chooses to accept, responsibility for the violation(s), appropriate sanction(s) will be issued. If the student chooses to deny responsibility, the student will then meet with a Judicial

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Review Board. During a disciplinary review meeting, students will:

- a) Have the opportunity to state his/her side of the case and provide any additional information that might be helpful in resolving the case.
- b) Receive written notification of the results of the judicial review meeting at the conclusion of the meeting.

### **APPEAL PROCESS:**

The Dean of Students will address appeals of decisions made by the Judicial Review Board. These appeals must be submitted in writing, via email, within three working days of the notification. Appeals will only be accepted for the following reasons:

1. Insufficient evidence to support decision
2. Harshness of sanction
3. Procedural irregularity
4. New evidence

The reason of a student's appeal must be included in the written appeal. It is up to the Dean of Students to determine whether the appeal statement clearly identifies and explains one or more of the above reasons for the appeal. In the absence of such demonstration, the appeal will be denied and the sanctions stand. The appeal is not an opportunity to argue that the initial decision was wrong. If the Dean of Students determines that there is an acceptable reason(s) for an appeal, based on those indicated above, he/she will refer the case back to the Judicial Review Board for further evaluation and possible adjustment of sanctions.

### **UNIVERSITY DISCIPLINARY REVIEW BOARD PROCESS:**

When a violation of university community or residential standards requires the convening of a University Disciplinary Review Board, the following procedure will be initiated by the Office of Student Services:

1. The University Disciplinary Review Board will be established consisting of the following five members: one administrator (who will serve as the chair of the board), one faculty member, one representative from the Athletic Department, a student resident director, and the President of Student Senate. Meeting minutes will be recorded.
2. The student accused of the violation will meet with the Dean of Students and charges and recommendations as a result of the violation(s) will be issued and explained.
3. A date and time of the hearing will be set.
4. The student is allowed to have two people present during the hearing.
5. The Dean of Students or Judicial Review Committee representative will introduce information about the disciplinary history of the accused and other relevant information. The Dean of Students or Judicial Review Committee will recommend a plan of action. The student will have the opportunity to provide his or her account of event(s). The Board will determine if the recommended sanctions will be imposed.
6. The accused student will receive written notice within 24 hours of the hearing.

The decision of the University Disciplinary Review Board is final with no avenue of appeal.

**ADDITIONAL STUDENT SERVICES INFORMATION**

For information on the following, please see the current Student Handbook available at:

[http://www.trine.edu/campus\\_life/student\\_handbook/](http://www.trine.edu/campus_life/student_handbook/)

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

## **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](http://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.

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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 453 Co-op Work Experience. Through this course, the student will prepare and submit a comprehensive report on his/her work experience. Upon approval of the finished report, three (3) hours of academic credit will be awarded.

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**

The Office of Financial Aid manages the work study program. All on-campus work study positions are posted on [www.trinecareers.org](http://www.trinecareers.org).

## **ACADEMIC INFORMATION**

### **PLANNING**

#### **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.

#### **PREPARATORY COURSES**

Every Trine University academic program has a mathematics component. Faculty advisors recommend a beginning mathematics course based upon student's SAT and/or ACT exam results and high school GPA. If adequate information regarding a student's math skills is not available, a student may be required to take a mathematics placement exam. A student may be assigned to non-credit, preparatory courses in mathematics or English.

#### **ONLINE COURSES FOR MAIN CAMPUS STUDENTS**

- A student must be in good academic standing to be eligible to register for an online course.
- Students may take two online courses per semester with the approval of their academic advisors during the regular academic year (fall and spring semester).
- Students may take two online courses per six-week session with the approval of their academic advisors during the summer term.

#### **CHANGING A MAJOR (MAIN CAMPUS)**

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

Change-of-major forms are available in the *Office of the Registrar*. Admission requirements for each major are available in the departmental office.

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 (This includes students in the Allen School of Engineering & Technology who change from an engineering major to Design Engineering Technology.), 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 and if the student is not currently enrolled in those courses. 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 process the change through the Office of Admission.

## CHANGING A MAJOR (SCHOOL OF PROFESSIONAL STUDIES)

To change a major, students must get the approval of the education center director or assigned faculty adviser. Change-of-major forms are available at the regional education center. Admission requirements for each major are available from the education center 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 (Bachelor of Applied Management, Bachelor of Business Administration, Associate in Accounting, Associate in Business Administration)

**Category 2:** Arts & Sciences degrees (Bachelor of Science in Criminal Justice, Bachelor of Science, Bachelor of Arts)

**Category 3:** Engineering and Technology degrees (Associate of Science, Associate of Science in Engineering Technology, Bachelor of Computer Science, Bachelor of Engineering, Bachelor of Science in Engineering Technology)

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.
- . If student is not currently enrolled in those courses.

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.

## FULL-TIME STUDENT

A full-time student at the main campus is one who is carrying a minimum of 12 academic credit hours. If a student wishes to register for more than 18 credit hours, he or she must have written permission as follows: 19–20 credits requires permission from the department chair; 21–23 credits also requires permission from the school dean; and 24 or more credits also requires permission from the vice president for academic affairs.

## CLASSIFICATION OF STUDENTS

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

CLASS	CREDITS
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.

### **NON-DEGREE STUDENT**

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. A change from non-degree to degree status is processed by the Office of Admission.

### **FOUNDATION 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 “Foundations” student.

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

*Allen School of Engineering & Technology:*

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

*All other schools:*

- Minimum of a 2.0 GPA

### **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 and critical thinking.

### **GENERAL EDUCATION OUTCOMES**

After completion of the general education curriculum, the student will be able to:

- present written thoughts in an effective manner using correct grammar, punctuation, and organization of ideas,
- communicate thoughts orally in an effective manner,
- demonstrate critical thinking skills utilizing information and thought processes by various perspectives listed in the philosophy, and
- demonstrate use of quantitative problem solving and reasoning skills.

The General Education Requirements consist of courses in two categories: skills and perspectives

Skills courses include written and oral communication courses as identified by individual degree programs.

Perspective courses are required for all degrees, with specific information identified in the General Education Requirement section of the catalog. Perspective courses are divided into the following areas:

Sciences – to learn to use analytical tools and applications in the study of that which is material.

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Mathematics – to learn to connect mathematical ideas and applications in the study of that which is material.

Humanities – to learn to appreciate the achievements which humanity has accomplished.

Social Sciences – to gain insight into the effects of human behavior on the individual, society, and the world through history as well as in current times.

### GENERAL EDUCATION REQUIREMENTS FOR ALL BACHELOR DEGREES

Area	# of semester hours
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<b>Written Communication</b>	
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(must include ENG 103 or ENG 104 and either ENG 113 or ENG 133)	6
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<b>Oral Communication</b>	
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(SP 203 or COM 163)	3
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<b>Social Sciences &amp; Humanities</b>	
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(*take at least two courses from Social Sciences and at least two courses from Humanities. See table that follows.)	12
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<b>Mathematics &amp; Science</b>	
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(must include at least 1 course in mathematics and 1 course in science)	10
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<b>Other</b>	
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(additional hours to be taken from the above categories*)	11
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<b>TOTAL</b>	<b>42</b>
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\*EXS 102 – Lifetime Wellness may be used to satisfy two (2) of the eleven (11) “Other” hours. HNR 121 – Introduction to Honors Seminar may be used to satisfy one (1) hour of the eleven (11) “Other” hours. Any approved computer literacy course may be used to satisfy three (3) of the eleven (11) “Other” hours under General Education requirements.

**Cultural Events** requirement: students must attend eight university-approved cultural events over the course of four years, with no limitations on the number of events per semester. Attendance at off- campus cultural events may be possible if first approved by the university.

The cultural events requirement relates to the university’s mission in that cultural events are co-curricular experiences that cultivate the holistic development of students.

Examples of cultural 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

**BACHELOR DEGREES**

Humanities		Social Sciences	
ARC 293	FLM 203	ECO 213	HIS 213
ART 253	FRN 113	ECO 223	HIS 251
CHN 113	FRN 123	ECO/SOC 243	HIS 423
CHN 123	GER 104	ECO 323	HIS 433
COM 123	GER 114	ECO 363	HNR X2X
COM 203	GER 203	ECO 383	PSY 113
COM 233	GER 213	ECO/HIS 393	PSY 313
COM 363	HIS 253	GEO 213	PSY 323
ENG 153	HNR X1X	GEO 303	PSY 333
ENG 204	MUS 123	GEO 313	PSY/SOC 343
ENG 233	MUS 223	GEO 323	PSY 353
ENG 214	MUS 272	GEO/GOV 353	PSY 383
ENG 253	MUS 273**	GOV 113	PSY 393
ENG 263	PHL 203	GOV 313	PSY 403
ENG 273	PHL 251	GOV 333	PSY 413
ENG 323	PHL 313	GOV /HIS 323	SOC 103
ENG 333	PHL 323	GOV/HIS 343	SOC 313
ENG 363	PHL 333	GOV/HIS 363	SOC 323
ENG 403	PHL 343	GOV/PSY 373	SOC 333
ENG 423	SP 103	GOV/HIS 403	WS 103
ENG 433	SPN 103	HIS 103	
ENG 443	SPN 113	HIS 113	
ENG 2013	SPN 123	HIS 203	
ENG 2023	SPN 203		
ENG 2113	SPN 213		
ENG 2123			
ENG 3303			
ENG 3313			

\*\*School of Professional Study course only

**GENERAL EDUCATION REQUIREMENTS FOR ALL ASSOCIATE DEGREES\***

<b>Area</b>	<b># of semester hours</b>
<b>Written Communication</b> (must include ENG 103 or ENG 104 and either ENG 113 or ENG 133)	6
<b>*Social Sciences &amp; Humanities</b>	6
<b>*Mathematics &amp; Science</b>	7
Other	3
<b>TOTAL</b>	<b>22</b>

\*The above choices must include at least one course from the following perspective areas: Social Sciences, Humanities, Mathematics, and Sciences.

**ASSOCIATE DEGREES**

Humanities		Social Sciences	
ARC 293	FLM 203	ECO 213	HIS 213
ART 253	FRN 113	ECO 223	HIS 251
CHN 113	FRN 123	ECO/SOC 243	HIS 423
CHN 123	GER 104	ECO 323	HIS 433
COM 123	GER 114	ECO 363	HNR X2X
COM 203	GER 203	ECO 383	PSY 113
COM 233	GER 213	ECO/HIS 393	PSY 313
COM 363	HIS 253	GEO 213	PSY 323
ENG 153	HNR X1X	GEO 303	PSY 333
ENG 204	MUS 123	GEO 313	PSY/SOC 343
ENG 233	MUS 223	GEO 323	PSY 353
ENG 214	MUS 272	GEO/GOV 353	PSY 383
ENG 253	MUS 273**	GOV 113	PSY 393
ENG 263	PHL 203	GOV 313	PSY 403
ENG 273	PHL 251	GOV 333	PSY 413
ENG 323	PHL 313	GOV /HIS 323	SOC 103
ENG 333	PHL 323	GOV/HIS 343	SOC 313
ENG 363	PHL 333	GOV/HIS 363	SOC 323
ENG 403	PHL 343	GOV/PSY 373	SOC 333
ENG 423	SP 103	GOV/HIS 403	WS 103
ENG 433	SPN 103	HIS 103	
ENG 443	SPN 113	HIS 113	
ENG 2013	SPN 123	HIS 203	
ENG 2023	SPN 203		
ENG 2113	SPN 213		
ENG 2123			
ENG 3303			
ENG 3313			

\*\*School of Professional Studies course only

## **GRADUATION REQUIREMENTS**

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.
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. Cultural Events requirement: students must attend eight university-approved cultural events over the course of four years, 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. Attendance at off campus cultural events may be possible if first approved by the university.  
*(Implementation date Fall 2011)*

## **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. The last 30 credits of a four-year degree program or the last 16 credits of a two-year degree program must be taken at Trine University unless a waiver is granted by the academic dean upon the recommendation of the department chair.

### **THE SECOND DEGREE**

A candidate for a second Trine University baccalaureate degree is required to complete a minimum of 30 credit hours in residence above the total credit requirements for the first baccalaureate degree. In addition, the candidate must complete all other requirements for the second degree. A candidate for a second Trine University associate degree is required to complete a minimum of 16 credit hours in residence above the total credit requirements for the first associate degree as well as meet all course requirements. 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.

Two baccalaureate 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 30 credit hours more than 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.

### **ACADEMIC MINOR OR SECOND MAJOR**

A candidate for a minor must file a minor declaration form with the registrar. Second majors must also be declared and are possible with certain degree programs. Students should check with their academic department, if interested. Students are subject to the program (major/minor) requirements in effect at the time the major or minor is declared.

### **SCHOLASTIC AWARDS AT GRADUATION**

**GOLD KEYS:** Gold Keys are awarded to bachelor degree students enrolled at the main campus that have earned GPAs of 3.750 or better while carrying at least 15 credit hours in each of four consecutive semesters. In the event that a student qualifies for the equivalent of a second Gold Key, the name of that person is placed upon a scholastic plaque. The exception to this policy is when a main campus student meets all requirements of the second gold key with the exception of the requirement of registering for 15 credits in the final term. The student's name will be placed on the scholastic plaque provided the student has registered for a minimum of 12 credit hours, which are the final credits required for graduation.

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**SILVER KEYS:** Silver Keys are awarded to associate degree main campus students who earn 3.750 grade point averages or better while carrying at least 15 credit hours in each of two consecutive semesters.

**GRADUATION WITH HONORS:** An undergraduate candidate for graduation will have his or her diploma inscribed as graduating cum laude if he or she achieves a cumulative grade point average of 3.500 to 3.749, magna cum laude if he or she achieves a cumulative grade point average of 3.750 to 3.949, or summa cum laude for a cumulative GPA of 3.950 or higher. The grade point average will be computed on the basis of all courses taken while at Trine University. To qualify for the award, a candidate for a bachelor's degree must earn a minimum of 40 semester hours at Trine University, and a candidate for an associate degree must earn a minimum of 20 semester hours.

**HONORS DAY:** For the purpose of Latin honors recognition at Honors Day, the grade point average requirement will be based upon the student's cumulative GPA before spring grades are posted. For such recognition, a minimum of 40 Trine University credits must be completed by the end of the spring term for a bachelor's degree or a minimum of 20 Trine University credits for an associate degree. Latin 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.

### 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	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
S	Satisfactory	not figured into GPA
U	Unsatisfactory	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	

(issued only under special circumstances)

**GRADE OF INCOMPLETE (MAIN CAMPUS)**

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 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 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. 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 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.

(issued only under special circumstances)

**GRADE OF INCOMPLETE(SCHOOL OF PROFESSIONAL STUDIES)**

Any Trine University School of Professional Studies student who is granted an “Incomplete” course grade must have a documentable illness, emergency, or other situation beyond their control that prevents them from completing the course’s requirements by the end of the academic term. An “Incomplete” is a temporary grade that is assigned at the instructor’s discretion, with the approval of the Campus Director.

A student’s request for an “Incomplete” will be approved only if ALL of the following circumstances are met:

1. An illness or other extenuating circumstance that legitimately prevents the student from completing required coursework by the due date. (Written documentation is required to be presented to the instructor and Campus Director); and
2. The student’s attendance has been satisfactory (per Financial Aid standards); and
3. The course requirements specified in the syllabus are 75 percent successfully completed; and
4. The student submits their request in writing during the current term, prior to the final drop date of the term.

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A plan for completion of the course must be prepared and attached to the student's request, which must include:

1. The course requirements that must be completed by the student in order to change the "Incomplete" to a letter grade; and
2. Specific due dates by which each course requirement must be completed by the student; and
3. Signatures indicating agreement and approval of the plan by the Student, Instructor, and Campus Director.

The remaining course requirements must be completed within eight weeks of the end of the semester in which the "Incomplete" was granted. If the student fails to meet any of the specific due dates, the "Incomplete" grade will be changed to the appropriate letter grade based on the work completed. The Instructor is responsible for completing the grade change form and submitting to the Campus Director who will then submit it to the Registrar's Office.

### **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 semester for completion. An "IP" grade not removed within one year from the end of the semester in which the "IP" grade was issued will be converted to an "FI" by the registrar. An "IP" grade may not be removed by registering again for the course.

### **COURSE REPEAT**

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.

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**

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

### **GRADE APPEALS**

The awarding of grades is the prerogative of the classroom instructor in accordance with policies posted in the Trine University Catalog. 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 due to miscalculation or clerical error, the error should be reported to the Registrar immediately on the prescribed form. The appropriate program chair/director must approve any adjustment of grades.

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

- Approach the professor and explain the problem.
- If the professor and student do not come to an agreement, the student should write a letter to the program director/chair.

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- If the program director/chair's mediation does not resolve the issue, the student should file a written appeal to the Dean.

If these steps do not resolve the problem, or if impractical, the student may petition the Grade Review Board in writing for a hearing of the issue. Information regarding this may be obtained from the Vice President for Academic Affairs. The petition shall set forth in detail the basis for the review. This should be done by the midterm of the first regular term following the assignment of the grade. The Board may grant an extension of this time limit. If the Board agrees to hear the case, it will so inform the student by the end of that term. In grade review cases, the student is responsible for presenting evidence to support his/her position.

At the Grade Review Hearing, the student shall present his/her argument followed by the professor's response. The Board shall promptly prepare a written recommendation and forward copies to all parties involved, including the Chairperson and Vice President for Academic Affairs. The report shall include dissenting opinions on the Board, if any. Recommendations of the Board are advisory. In cases involving death, incapacity, or prolonged inaccessibility of the professor, or in similar unusual circumstances, the professor's immediate supervisor is responsible for assigning the grade. Records of each case heard by the Board shall be maintained in the office of the Vice President for Academic Affairs. If the student or professor involved wishes to appeal the decision on procedural grounds, he/she should file an appeal within two working days for the decision with the Vice President for Academic Affairs. If any procedural irregularities are discovered, he/she will notify the student and the Board within ten working days after the appeal.

The Vice President for Academic Affairs shall appoint the faculty members who will serve on the Board. He shall choose one regular member and one alternate (who will be from a different department, if possible) from each school. In addition, the Student Senate shall elect two student members and their alternates. Student members must have junior or senior standing. The faculty members shall serve three-year, staggered terms, and faculty members serving their third year will chair the committee. Student members shall serve one-year terms.

### **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 if they will be dropping below 12 credit hours.

All students dropping below full-time status must have the approval of the director 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

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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.

### **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.

### **SCHOLASTIC AWARDS AT THE END OF EACH SEMESTER**

**THE PRESIDENT’S LIST:** A main campus student whose semester grade point average is 3.750 or better, while carrying at least 15 credit hours, will be placed on the President’s List.

**THE DEAN’S LIST:** A main campus student whose semester grade point average is between 3.500 and 3.749, while carrying at least 15 hours, will be placed on the Dean’s List.

### **CLASS ATTENDANCE AND EXCUSED ABSENCES (MAIN CAMPUS)**

Students are expected to attend all class and laboratory sessions. Absences may be permitted for reasonable causes such as illness, disabling injury, death or serious illness in the immediate family, or in the case of a court order. 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 Academic Affairs Office or Student Retention Office to inform Trine University of the death of an immediate family member (parent, legal guardian, spouse, sibling and/or child). Under these circumstances a student will be excused from class attendance for up to one week. The student shall make arrangements for completion of course with his/her professors upon return.

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.

### **ATTENDANCE POLICY (SCHOOL OF PROFESSIONAL STUDIES)**

All students are expected to be in their class, on time and for the entirety of the class. Once a student misses three (3) sessions of any one class he/she will be dropped from the course

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with a “W”. Only in the event of rare and unusual circumstances, with formal documentation, will a student be allowed to continue.

### 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;
- 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.**

### ACADEMIC PROBATION

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 on page 53 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 on page 53 for further explanation of required GPA.)
- Degree seeking students who have attempted 60 or more semester hours of course work and have a cumulative grade point average lower than 2.0. Transfer hours are

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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 achieve at least a 2.0 GPA in summer courses will not be dismissed. Students on probation who raise their cumulative GPA to acceptable academic graduation standards will be removed from probationary status.

After a period of not less than one semester (not including summer school), 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:

- They will be required to attend a meeting explaining a student success plan.
- They may not register for more than 15 credit hours. If they wish to take more, they must petition the Readmission/Probation Committee for permission.
- They may not participate in the “rush” system for any fraternity or sorority.
- They are not eligible to participate in any athletic competition. They may practice with the team only if their coach approves. They will not be permitted to travel with the team without approval of the athletic director.

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

### **GRIEVANCE PROCEDURE**

All academic concerns may be discussed with the appropriate school official, however only the violation of a University rule, regulation or policy will be considered for formal review as stated in the Grievance Policy and all informal attempts at settling the grievance must have been attempted. To file a formal grievance, a student must follow the following steps.

#### **Informal Process**

**Step one:** A student must first attempt to resolve the grievance with the person responsible for the action. An appointment for discussion should be made by the student, and the student should be prepared to provide evidence for supporting the grievance. The student and person responsible should work to resolve the issue.

**Step two:** If the issues cannot be settled between the person responsible and the student, the student should meet with the immediate supervisor of the person. If satisfaction cannot be reached, then the student should proceed to the formal grievance process.

#### **Formal Process**

**Step One:** The student should prepare a written request for the Dean of the School. This request must be submitted before the completion of the term following the incident and should include the following sections:

1. The date of submission

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2. The name of the student and his/her student ID number
3. The department in which the student is enrolled
4. Facts and documentation supporting the nature of the complaint
5. A summary of the informal steps that have been taken, copies of any documents created during that process, and reasons why the informal process was not satisfactory
6. Names of up to five witnesses to the situation and their contact information
7. Suggestions for resolution

**Step Two:** The Dean (or his designee) will review the grievance and will affirm, deny or modify the recommendation. A response letter must be written and provided to the student within 10 class days. If the student wishes to appeal the decision of the Dean, he/she must file the grievance appeal to the Dean's response within 10 class days of receiving the response letter.

**Step Three:** A hearing before the Grievance Committee is called by the Dean within 10 class days of receiving the appeal. All materials must be provided to the Committee by the student. They will hear the grievance, listen to the student and the witnesses, and forward a recommendation to the Assistant Vice President for Resources and Planning within ten class days.

**Step Four:** The Assistant Vice President will render a decision and will communicate that decision in writing to all entities involved in the grievance process within 10 class days. That decision will be considered final.

### FULL-TIME STUDENT

A full-time student at the main campus is one who is carrying a minimum of 12 academic credit hours. If a student wishes to register for more than 18 credit hours, he or she must have written permission as follows: 19–20 credits requires permission from the department chair; 21–23 credits also requires permission from the school dean; and 24 or more credits also requires permission from the vice president for academic affairs.

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

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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.

## **WITHDRAWAL FROM THE UNIVERSITY**

### **VOLUNTARY**

A student wishing to withdraw from the University during a term may obtain a withdrawal form from the registrar. A student living in a residence hall should consult the Housing Director in Student Services about the room and board refund policy.

A student who plans to return to Trine University within one calendar year may apply for a Planned Academic Leave (PAL). Details and application forms are available in the Office of the Registrar.

### **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 may 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).

#### ***Excessive Absence Dismissal***

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A student may be suspended or 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, earns no credits for the semester, and is 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. 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.

### **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 students are mailed to permanent addresses for domestic students and to local addresses for international students.

In cases of unsatisfactory work, a student may be warned, placed on probation or dismissed from the University.

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. Copies of the transcript are available to the student upon written request and advance payment, as determined per copy.

### **RELEASE OF INFORMATION FROM STUDENT ACADEMIC RECORDS**

To ensure compliance with the federal government's Family Education Rights and Privacy Act (FERPA), the following general principles and procedures govern the release of information from student academic records.

A written request signed by the student whose name appears on the transcript and that contains information such as date of birth and/or the Trine University student identification number, is required before a University transcript or other information from the student's academic record may be released. Trine University will not release copies of transcripts from another institution. Exceptions to the above statements are outlined in the next paragraph:

- The Office of the Registrar may release transcripts or information from academic records including reports of academic standing to administrative and faculty members of Trine University whose responsibilities require this information.
- Public directory information from student records may be released at any time unless restricted by the student. This includes the student's name, local and permanent addresses and telephone numbers, e-mail address, date and place of birth, major field of study, class year, participation in officially recognized activities and sports, weight and height of athletic team members, dates of attendance, degrees, awards received, and photographs.
- Information pertaining to graduation and honors achieved may be released for publication unless otherwise restricted by the student.

Upon proper identification, a student will be shown the following:

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- His or her Trine University permanent academic record, including the student's file and transcript
- His or her transcripts from another institution.

A hold may be applied to the release of a transcript or other information requested from an academic record for a student who has an overdue indebtedness to the University.

A current student may obtain a maximum of five unofficial (personal) copies of his or her Trine University transcript at no charge while attending the University. All official transcripts which bear the registrar's signature and school seal are \$3 per copy. Additional unofficial transcripts are also \$3 per copy.

## **ACADEMIC OPPORTUNITIES**

### **Dual Enrollment, ESL, Honors Program, ROTC, Study Abroad, and 3+3 & 4+1 Programs**

#### **DUAL ENROLLMENT (Dual Credit Program for High School Students)**

Through the Dual Enrollment Program, 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 dual enrollment program).

To qualify for the Dual Enrollment Program, 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), successfully completed the sophomore year of high school, 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 Dual Enrollment Program generally rent books through their regular high school book rental program (this is decided by the participating high school).

All Dual Enrollment students must sign enrollment forms which cover the policies and procedures related to the 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 Program is a member of the National Alliance of Concurrent Enrollment Partnerships (NACEP).

More information is available at [www.trine.edu/dual-enrollment](http://www.trine.edu/dual-enrollment) or by calling the Dual Enrollment office at 260.665.4648 or 260.665.4655.

#### **ESL PROGRAM –(ENGLISH AS A SECOND LANGUAGE)**

In concert with the mission of Trine University, the mission of the ESL program is to provide Non-Native English Speaking Students with all the skills necessary to be successful in U.S. institutions of higher learning, to lead enriched lives during their time in the United States, and to share their cultures with their local communities.

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To achieve this mission, the Trine University ESL program emphasizes:

- expecting and requiring the highest ethical standards from its students, faculty and support staff
- modeling and clearly explaining the rules of classroom etiquette
- respecting each student's culture while modeling and clearly explaining U.S. culture and traditions
- defining and promoting ethical study and test-taking practices
- providing daily opportunities for individual meetings with faculty
- requiring active classroom participation
- systematically teaching the four areas of language skills: reading, writing, understanding, and speaking
- promoting active participation in the local community
- providing opportunities to share students' cultures with the local community

Trine University's ESL Program envisions seven core values. They are:

1. Providing a secure environment that embraces diversity
2. Breaking down language and cultural barriers through education
3. Focusing on the needs of the students
4. Maintaining and teaching the highest ethical standards in all activities
5. Providing quality instruction and individualized help as needed
6. Promoting professional growth
7. Recognizing each student as an individual with potential greatness

The Trine University ESL program is comprised of four levels:

1. In level 1, students practice the basics of English Communication.
2. In level 2, students improve on basic communication tasks while gaining exposure to academic English.
3. Level 3 students have a good command of English for communicative purposes and concentrate more on academic skills.
4. In level 4, students focus on the academic skills they will need for matriculation into their degree program.

Students who do not meet the English language proficiency requirement for admission directly into a University degree program may apply for admission to the English as a Second Language program with "conditional admission" to a University degree program.

The intensive ESL program strives to prepare non-native English speaking students with the academic, cultural, and social language skills needed for success in an American university setting and in everyday life in the United States. It offers a variety of classes to non-native English speakers who need to improve their English language skills before entering their academic field of study. Students who score below minimum requirements on the IELTS or TOEFL and those who do not have a TOEFL or IELTS score are placed in the appropriate level of English Language proficiency based on the results of an ESL placement test taken upon their arrival to the university.

The English as a Second Language Program at Trine University offers non-credit intensive English language courses to highly motivated international students whose native language

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is not English. The ESL program is designed to help equip students with the skills necessary to read, write, speak, and understand American English, so they can successfully complete college-level courses. Students will be tested at the end of the first semester of the ESL program and may need to continue taking intensive English preparation courses either full-time or part-time in combination with regular college courses as recommended by the Director of the ESL program. Students may begin their full-time degree program after successful completion of the ESL program.

In order to matriculate into a degree program, students must attain an overall average of C+ in all their level 4 courses.

Undergraduate students may also enter into a degree program by officially submitting a score of 71 on the TOEFL iBT (530 PBT) or 6.0 on the IELTS test before the last day to drop/add courses. Graduate students need a TOEFL iBT of 79 (550 PBT) or 6.5 on the IELTS.

### **HONORS PROGRAM**

The mission of the Trine University 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 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 1220/ACT 27 and a High School GPA of 3.750 or higher may be invited into the Honors Program. The Honors Program Director will review qualifications of incoming freshmen and will make recommendations for admittance, which will then go before the Honors Program Advisory Board for final approval. Current Trine University freshmen or sophomores may also apply for admission into the Honors Program. These students must notify the Honors Program Director of their intentions, have a current Trine University GPA of 3.500 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 accepted into the Honors Program will need to earn 22 Honors Program Points and satisfy the basic requirements for each category listed below. In addition, students also must maintain a 3.500 GPA to successfully earn an Honors Degree.

#### **Introduction to Honors Seminar—HNR 121 (1 pt)**

Honors students are required to take this course their first semester in the Honors Program. This course provides an introduction to the Honors Program and is also a forum to read about and discuss various current topics. Writing, critical thinking, and classroom discussion are emphasized. This is a one credit hour course and can be applied toward a student's social sciences general education requirements.

#### **Honors Courses/Contract Courses (13 - 16 pts)**

Honors students are required to compile at least 13 points with any combination of dedicated HNR courses, honors sections of regularly offered courses, or contract courses

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in their departments. 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. Students must take courses in at least two of the three categories listed above.

### **Enrichment Experiences (4 -6 pts)**

Honors students are required to participate in extracurricular activities that enrich classroom learning. These activities are varied in scope and will center on the students' interests. Students are required to earn at least one enrichment experience point per year to total a minimum of four points before graduation.

### **Honors Project (4 pts)**

Honors students are required to complete an Honors Project during their senior year. 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. 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 Honors Program, a student must maintain a 3.500 cumulative grade point average at the end of each academic year. A student whose GPA falls below 3.500 will be placed on probation in the Honors Program and will have one semester to raise his/her GPA. A student may only be placed on probation once. If the GPA would fall below 3.500 a second time, the student would be removed from the Honors Program.

## **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 21<sup>st</sup> 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. For more information contact Shawn P. Braue, Lt Colonel, USAF; 574.631.4675.

## **STUDY ABROAD PROGRAM**

Do you plan to take on the world? We'll put you in it. Learning is about doing and seeing at Trine. Imagine combining your studies with firsthand experiences—studying foreign cultures, or learning new languages.

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To truly excel, you'll need a broad perspective, the kind you get from immersing yourself in experiences and exploration. As a student traveling abroad, you'll learn what it means to be a global citizen. You'll prepare to work with international companies, diverse people, and a global economy.

### **Pick your program**

Trine offers three separate study abroad programs. You can enroll in semester, yearlong, or summer programs through our partner providers: International Studies Abroad (ISA) and GlobalLinks Learning Aboard or with our partner universities. Most students opt for one semester (typically second semester of sophomore year or first semester of junior year) or a summer session (typically the summer between sophomore and junior years or between junior and senior years).

It is critical that you begin planning early in your academic career particularly if your major has a fairly rigid list of courses offered in a certain sequence. Talk with your academic advisor and visit with the Trine Study Abroad office to discuss your options.

### **DPT 3 + 3 Degree Path**

Please see the School of Health Sciences for information on the 3 + 3 program. We offer a six year plan of study to qualified students leading to a bachelor's degree in either exercise science or biology and a Doctor in Physical Therapy.

### **ENGINEERING 4 +1 Degree Path**

Please see the Allen School of Engineering and Technology for information on the 4 + 1 program. We offer a five year plan of study to qualified students leading to a bachelor's degree and a Master's degree in Engineering.

### **BUSINESS 4 +1 Degree Path**

Please see the Ketner School of Business for information on the 4 + 1 program. We offer a five year plan of study to qualified students leading to a bachelor's degree and a Master's degree in Business.

### **CRIMINAL JUSTICE 4 +1 Degree Path**

Please see the Jannen School of Arts and Sciences for information on the 4 + 1 program. We offer a five year plan of study to qualified students leading to a bachelor's degree and a Master's degree in Criminal Justice.

# **TRINE UNIVERSITY GRADUATE INFORMATION**

## **GRADUATE POLICIES**

### **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.

### **ADMISSION REQUIREMENTS**

- A) **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:
1. A 3.0 GPA *and*,
  2. A bachelor's degree from a regionally-accredited institution in an appropriate academic field, *or*
  3. a bachelor's degree from a regionally accredited institution in a related field and significant major-specific professional experience, *or*
  4. a bachelor's degree from a non-regionally accredited institution in an appropriate or related field and GRE test scores of 475 verbal and 600 quantitative or higher on the old scale for tests administered prior to August 2011 or a combined verbal/quantitative score of 300 for tests administered after August 2011. (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.
- B) **International Students.** Applicants whose native language is not English must provide evidence of a minimum score of 550 on the paper-based or 79 on the internet-based Test of English as a Foreign Language (TOEFL) or an overall 6.5 on the International English Language Testing System (IELTS). They also must have earned at least a 3.0 GPA. If their undergraduate course work was not completed at an American institution, their transcripts will need to meet internationally accepted standards or be reviewed by professional credential evaluators. Some graduate programs may have additional admission requirements. Admittance to any graduate

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program is valid for one year from the time of admission to enrollment.

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

1. Completed graduate application
2. 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.
3. Three letters of recommendation as part of their application. Letters of Recommendation should be from individuals who have had a supervisory role over the student such as a professor or employer
4. Personal narrative that explains the student's interest in pursuing a graduate level education.

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

D) **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 1-page narrative describing the challenges or extenuating circumstances that led to the student earning less than 3.0 GPA in undergraduate work. Students must include a description of specific strategies they will use to ensure academic progress within the graduate degree program.
- An additional letter of recommendation from a professional colleague who can address the applicant's situation and potential for success.
- The applicant's resume or vita indicating positions held that demonstrate task commitment, knowledge and skill relevant to the applicable course of study.

Upon receipt of all the materials, the 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.

## STUDENT CLASSIFICATIONS

### 1. Dual Undergraduate/Graduate

- 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.
- **3+3 Doctor of Physical (DPT) degree program**  
Dual undergraduate/graduate enrollment status is granted to those students who have completed the first 3 years of the 3+3 Doctor of Physical (DPT) 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.

### 2. 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 Technology. These students will be changed to graduate status after earning 132 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.

### 3. 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

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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.

### **ACADEMIC RESIDENCY/TRANSFER CREDIT**

A maximum of 6 semester hours (regionally accredited or equivalent) of graduate course credit completed at other graduate schools 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. This policy does not apply to the 3+3 Doctorate of Physical Therapy program.

The final 15 credits of a graduate degree must be taken at Trine University unless a waiver is granted by the academic dean upon recommendation of the program chair/director.

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.

### **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.

### **CREDIT BY EXAMINATION**

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

### **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

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S	Satisfactory	not figured into GPA
U	Unsatisfactory	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.	

### **INCOMPLETE GRADE POLICY**

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. Incomplete grades are rarely assigned and only if the student has satisfactorily completed the vast majority 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 program 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 within one semester in which the "I" grade was issued will be converted to an "FI" grade 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 program 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.

### **IN PROGRESS GRADE POLICY**

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 semester for completion. An "IP" grade not removed within one year from the end of the semester in which the "IP" grade was issued will be converted to an "F" by the registrar. An "IP" grade may not be removed by registering again for the course.

### **SATISFACTORY**

The "S" (Satisfactory) grade indicates that credit has been given for completion of degree requirements other than academic course work. 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

## Trine University

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 course work. In graduate programs, this symbol may be used for clinical practicums and internships.

### **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.

### **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 if they will be dropping below 9 credit hours.

All students dropping below full-time status must have the approval of the director 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 program chair/director of the student’s department. 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 after completing 80 percent of the semester, and whereby no “WP” was awarded.

Any deviation from the policy will be considered an unofficial withdrawal, and a grade of “F” will be issued.

### **ACADEMIC STANDING**

Students whose cumulative GPA drops below a 3.0 will be dismissed from Trine University. 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

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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.

### **GRADE APPEALS**

The awarding of grades is the prerogative of the classroom instructor in accordance with policies posted in the Trine University Catalog. 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 due to miscalculation or clerical error, the error should be reported to the Registrar immediately on the prescribed form. The appropriate program chair/director must approve any adjustment of grades.

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

- Approach the professor and explain the problem.
- If the professor and student do not come to an agreement, the student should write a letter to the program director/chair.
- If the program director/chair's mediation does not resolve the issue, the student should file a written appeal to the Dean.

If these steps do not resolve the problem, or if impractical, the student may petition the Grade Review Board in writing for a hearing of the issue. Information regarding this may be obtained from the Vice President for Academic Affairs. The petition shall set forth in detail the basis for the review. This should be done by the midterm of the first regular term following the assignment of the grade. The Board may grant an extension of this time limit. If the Board agrees to hear the case, it will so inform the student by the end of that term. In grade review cases, the student is responsible for presenting evidence to support his/her position.

At the Grade Review Hearing, the student shall present his/her argument followed by the professor's response. The Board shall promptly prepare a written recommendation and forward copies to all parties involved, including the Chairperson and Vice President for Academic Affairs. The report shall include dissenting opinions on the Board, if any. Recommendations of the Board are advisory. In cases involving death, incapacity, or prolonged inaccessibility of the professor, or in similar unusual circumstances, the professor's immediate supervisor is responsible for assigning the grade. Records of each case heard by the Board shall be maintained in the office of the Vice President for Academic Affairs. If the student or professor involved wishes to appeal the decision on procedural grounds, he/she should file an appeal within two working days for the decision with the Vice President for Academic Affairs. If any procedural irregularities are discovered, he/she will notify the student and the Board within ten working days after the appeal.

The Vice President for Academic Affairs shall appoint the faculty members who will serve on the Board. He shall choose one regular member and one alternate (who will be from a different department, if possible) from each school. In addition, the Student Senate shall elect two student members and their alternates. Student members must have junior or

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senior standing. The faculty members shall serve three-year, staggered terms, and faculty members serving their third year will chair the committee. Student members shall serve one-year terms.

### **ASSESSMENT**

The academic assessment process at Trine University is designed to measure the abilities and knowledge of students graduating from all degree programs. It also measures student satisfaction with the program. Sometimes students will be asked to reply to surveys or questionnaires that rate the quality of instruction, the level of satisfaction with career preparation, and the overall satisfaction of the Trine experience. Occasionally, anonymous samples of student course work will be used in an assessment process.

Trine University is committed to providing quality educational experiences for our students. The information gathered through the assessment process provides information for continual improvement of our programs.

### **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.

### **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;
- 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 exercise, written work, printing, design, computer

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program), 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.**

### DEGREES

An “Intent to Graduate” form obtained through the Registrar’s office 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.

### TRANSCRIPTS

A hold may be applied to the release of a transcript or other information requested from an academic record for a student who has an overdue indebtedness to the University.

A current student may obtain unofficial (personal) copies of his or her Trine University transcript at no charge while attending the University. All official transcripts which bear the registrar’s signature and school seal are available at an additional cost.

### RELEASE OF STUDENT INFORMATION

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 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. 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 disclose education records **without** a student's prior written consent under several FERPA exceptions including:

1. Disclosure to school officials with legitimate educational interests

-**A school official** is 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 or company with whom the University has contracted as its agent to provide a service instead of using University employees or officials (such as an attorney, auditor, or collection agent); a person serving on the Board of Trustees; or a student serving on an official committee, such as a disciplinary or grievance committee, or assisting another school official in performing his or her tasks.

- A school 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.

- The student's application for financial aid
- Submitting proof of dependency
- Response to a judicial order or subpoena
- A bona fide health or safety emergency
- Information requested by other schools in which the student seeks or intends to enroll

2. 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, except by the National Student Clearinghouse to loan guarantors. Trine University has designated the following as "student 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

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- Most recent previous educational institution attended
- Participation in officially recognized activities and athletic teams
- Height and weight of student athletes

**3. 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

### **SEMESTER HOUR LOAD**

The semester course load of a full-time graduate student is nine hours. The maximum load for a full-time master's degree student is 12 credits hours in any semester. Any master's degree course load greater than 12 credit hours must be approved by the program director.

## **TRINE UNIVERSITY GRADUATE PROGRAMS**

### **DOCTOR OF PHYSICAL THERAPY\*\***

### **MASTER OF BUSINESS ADMINISTRATION (MBA)**

#### **CONCENTRATIONS IN:**

- FINANCE
- MANAGEMENT

### **MASTER OF ENGINEERING WITH MAJOR IN:**

- CIVIL ENGINEERING

### **MASTER OF SCIENCE IN ENGINEERING MANAGEMENT (MSEM)**

### **MASTER OF SCIENCE WITH A MAJOR IN CRIMINAL JUSTICE**

#### **CONCENTRATIONS AND CERTIFICATES IN:**

- EMERGENCY MANAGEMENT
- FORENSIC PSYCHOLOGY
- LAW
- PUBLIC ADMINISTRATION

### **LOU HOLTZ MASTER OF SCIENCE IN LEADERSHIP**

#### **CONCENTRATIONS IN:**

- BIOMEDICAL REGULATORY AFFAIRS
- BUSINESS ADMINISTRATION
- HEALTHCARE SYSTEMS STUDIES
- HUMAN RESOURCE MANAGEMENT
- INSTRUCTIONAL LEADERSHIP - HIGHER EDUCATION
- INTERNATIONAL STUDIES
- NONPROFIT ORGANIZATIONAL STUDIES
- SPORT MANAGEMENT
- STRATEGIC FORESIGHT & ENTREPRENEURSHIP
- SUSTAINABLE AND ENVIRONMENTAL MANAGEMENT

\*\*Effective 7/29/2014, the Doctor of Physical Therapy Program at Trine University has been granted Candidate for Accreditation status by the Commission on Accreditation in Physical Therapy Education (1111 North Fairfax Street, Alexandria, VA, 22314; phone: 703-706-3245; email: accreditation@apta.org). Candidate for Accreditation is a pre-accreditation status of affiliation with the Commission on Accreditation in Physical Therapy Education that indicates that the program may matriculate students in technical/professional courses and that the program is progressing toward accreditation. Candidate for Accreditation is not an accreditation status nor does it assure eventual accreditation.

## DOCTOR OF PHYSICAL THERAPY

The Doctor of Physical Therapy Program 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 experience 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" and so 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.

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**DOCTOR OF PHYSICAL THERAPY****119 HRS.****PROGRAM REQUIREMENTS****REQUIRED HOURS**

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	(2)
DPT	5211	CARE II	(1)
DPT	5224	Anatomy of Movement II	(4)
DPT	5234	Applied Physiology II	(4)
DPT	5243	Clinical Practice II	(3)
DPT	5254	Applied Neuroscience	(4)
DPT	5311	CARE III	(1)
DPT	5352	Pharmacology	(2)
DPT	5362	Outcome Assessment	(2)
DPT	5343	Clinical Practice III	(3)
DPT	5372	Evidence Based Practice I	(2)
DPT	6111	CARE IV	(1)
DPT	6124	Musculoskeletal PT I	(4)
DPT	6134	Neuromuscular PT I	(4)
DPT	6142	Imaging and Laboratory Testing	(2)
DPT	6242	Cardiopulmonary PT	(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	6342	Orthotics and Prosthetics	(2)
DPT	6152	Lifespan I: Growth & Dev.	(2)
DPT	6272	Evidence-Based practice III	(2)
DPT	6282	Healthcare Delivery I	(2)
DPT	6291	Anatomy Seminar II	(1)
DPT	6314	Clinical Practicum	(4)
DPT	6352	Primary Care Practice	(2)
DPT	6252	Lifespan 2: Geriatrics	(2)
DPT	6362	Prof. Development II	(2)
DPT	6382	Healthcare Delivery II	(2)
DPT	7118	Clinical Internship I (8 weeks)	(8)
DPT	7128	Clinical Internship I (8 weeks)	(8)
DPT	7214	Clinical Internship III	(14)
DPT	7262	Professional Development III	(2)

**TOTAL****119 HRS.**

## **MASTER OF BUSINESS ADMINISTRATION (MBA)**

The *Master of Business Administration "MBA"* offered through Ketner School of Business is focused on delivering real world return on investment for professionals looking to develop their skills and marketability in business and finance. The Master of Business Administration program offers **two concentrations, Finance and Management**, and will require 31 credit hours for either concentration.

- ***Program Educational Objectives:***

The program has established the following educational objectives:

1. Utilize the managerial process and tools for effective management and leadership
2. Drive the fiscal and financial processes of a corporation at a managerial level
3. Develop professional communications skills in public speaking, public relations, and electronic media

- ***Program Learning Outcomes:***

- 1.1 Leadership skills to develop, motivate, and lead people
- 1.2 Tools in micro and macroeconomic theory and application
- 1.3 Develop of strategic thinking process for decision-making
- 1.4 Development of a professional ethical framework
- 2.1 Knowledge application of financial and managerial accounting concepts
- 2.2 Understanding of financial statement analysis to drive decision-making
- 2.3 Knowledge application of financial instruments and capital markets
- 2.4 Understanding of portfolio analytics and investment management
- 3.1 Effective public speaking at team, group, and company level
- 3.2 Managerial level understanding print, video, and social media communications
- 3.3 Tools for managing business information systems

**MASTER OF BUSINESS ADMINISTRATION  
WITH A CONCENTRATION IN FINANCE**

**31 HRS.**

**PROGRAM REQUIREMENTS**

**REQUIRED HOURS**

**BUSINESS COMMUNICATIONS**

**7 HRS.**

COM	5003	Public Relations for Executives	(3)
ENG	501	Research and Writing Skills for Professional Success	(1)
LDR	5223	Organizational Communications for Leaders	(3)

**BUSINESS STRATEGY**

**3 HRS.**

MGT	5093	Business Strategy and Decision Making	(3)
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**ETHICS AND LEADERSHIP**

**3 HRS.**

LDR	5203	Leadership Ethics, Culture, and Politics	(3)
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**ECONOMICS**

**3 HRS.**

ECO	5033	Micro and Macro Economic Decision Making	(3)
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**FINANCE**

**9 HRS,**

FIN	5063	Corporate Finance	(3)
LDR	5853	Investment Analysis and Portfolio Management	(3)
LDR	5843	Financial Markets and Institutions	(3)

**ACCOUNTING**

**3 HRS.**

FIN	6923	Managerial Accounting and Finance	(3)
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**MARKET STRATEGY**

**3 HRS.**

MK	6943	Strategic Marketing Management	(3)
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**TOTAL**

**31 HRS.**

**MASTER OF BUSINESS ADMINISTRATION  
WITH A CONCENTRATION IN MANAGEMENT  
PROGRAM REQUIREMENTS**

**31 HRS.  
REQUIRED HOURS**

**BUSINESS COMMUNICATIONS 7 HRS.**

COM	5003	Public Relations for Executives	(3)
ENG	501	Research and Writing Skills for Professional Success	(1)
LDR	5223	Organizational Communications for Leaders	(3)

**BUSINESS MANAGEMENT AND STRATEGY 6 HRS.**

GE	5103	Project Management	(3)
HR	5923	Strategic Human Resource Management	(3)

**ETHICS AND LEADERSHIP 3 HRS.**

LDR	5203	Leadership Ethics, Culture, and Politics	(3)
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**ECONOMICS 3 HRS.**

ECO	5033	Micro and Macro Economic Decision Making	(3)
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**FINANCE 3 HRS.**

FIN	5063	Corporate Finance	(3)
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**ACCOUNTING 3 HRS.**

FIN	6923	Managerial Accounting and Finance	(3)
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**MARKET STRATEGY 3 HRS.**

MK	6943	Strategic Marketing Management	(3)
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**OPERATIONS 3 HRS.**

BA	6953	Managing Business Information Systems	(3)
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**TOTAL 31 HRS.**

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## **MASTER OF ENGINEERING MAJORS**

### **MASTER OF ENGINEERING**

The rapid pace of technological advancement has resulted in a demand for engineers with advanced training. There is growing support for the concept that the master's degree should be the first professional degree for the practice of engineering. A proposal to require one year of education beyond the bachelor's degree for registration as a Professional Engineer is now being considered in many states. Engineers with the skills necessary to lead the design of a complex system are highly sought by industry. By emphasizing advanced design skills rather than research, the Master of Engineering program addresses this need.

## **CIVIL ENGINEERING GRADUATE PROGRAM**

### **MISSION AND OBJECTIVES**

The mission of the civil engineering program at Trine University is to provide graduates with quality preparation for the practice of civil engineering, to provide graduates with opportunities to pursue graduate studies, and to provide technical and educational services to their profession and communities. To meet these goals the following outcomes have been identified for the graduate program in civil engineering. A graduate of the Master of Engineering program with a Civil Engineering major must have:

1. the ability to apply knowledge in the specialized area of structural engineering,
2. the ability to understand business, management, and leadership fundamentals, and
3. the ability to clearly and effectively communicate design ideas in written and oral formats.

### **CURRICULUM**

Program requirements draw from the American Society of Civil Engineers' Body of Knowledge report, which outlines the knowledge, skills, and attitudes of a licensed professional engineer. The degree requires 30 semester credits. A student can choose from a capstone-course option, requiring 27 credits of approved coursework and a 3 credit capstone project, or a design/research project option, requiring 24 credits of approved coursework and 6 credits of design or applied research work.

**CIVIL ENGINEERING MAJOR**

**PROGRAM REQUIREMENTS**

**30 HOURS**

**CIVIL ENGINEERING CORE COURSES**

**15 - 18 HRS.**

- CE 5503 Advanced Structural Analysis
  - CE 5513 Structural Dynamics
  - CE 5533 Advanced Solid Mechanics
  - CE 5553 Structural Design Loads
  - CE 5563 Structural Systems
  - CE 5593 Special Topics in Structural Engineering
- Any 4000 level structures/geotechnical CE course with approval by the advisor

**GENERAL ENGINEERING CORE COURSES**

**3 - 9 HRS.**

- GE 5103 Project Management
- GE 5113 New Product Development and Innovation Strategies
- GE 5123 Lean Enterprise and Total Quality Management
- GE 5203 Design of Experiments
- GE 5213 Materials Failure Analysis
- GE 5303 Finite Element Methods

**BUSINESS/LEADERSHIP CORE COURSES**

**3 - 9 HRS.**

- FIN 503 Financial Analysis for Decision Making
- LAW 503 Public Policy and the Legal Environment
  
- MGT 523 Communications, Leadership and Ethics  
or
- LDR 5203 Leadership Ethics, Culture and Politics
  
- LDR 5062 Organizational Development and Change
- MGT 543 Operations Strategy and Management
- MGT 6043 Global Logistics & Supply Chain Management for Leaders

**CAPSTONE OR DESIGN/RESEARCH PROJECT\***

**3- 6 HRS.**

- CE 5903 CE Independent CE Project I
- CE 5913 CE Independent CE Project II

**TOTAL**

**30 HRS.**

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\*Note: A student can choose from a capstone-course option, requiring 27 credits of approved coursework and a 3 credit capstone project, or a design/research project option, requiring 24 credits of approved coursework and 6 credits of design or applied research work.

## MASTER OF SCIENCE IN ENGINEERING MANAGEMENT-MSEM

The Master of Science in Engineering program at Trine is designed specifically for professionals that already hold an engineering degree and will focus on manufacturing and engineering businesses.

- ***Program Educational Objectives:***

The program has established the following educational objectives:

1. Develop and lead a technical group or organization
2. Drive the fiscal and financial processes of a corporation at a managerial level
3. Develop professional communications skills in public speaking, public relations, and electronic media
4. Manage, direct, and evaluate the output of a technical organization to ensure that the work meets the quality, cost, delivery, and ethical standards

- ***Program Learning Outcomes:***

- 1.1 Leadership skills to develop, motivate, and lead people
- 1.2 Develop of strategic thinking process for decision-making
- 1.3 Development of a professional ethical framework
- 2.1 Knowledge application of financial and managerial accounting concepts
- 2.2 Understanding of financial statement analysis to drive decision-making
- 2.3 Knowledge application of financial instruments and capital markets
- 2.4 Understanding of portfolio analytics and investment management
- 3.1 Effective public speaking at team, group, and company level
- 4.1 Understanding of strategies and processes for developing innovative products
- 4.2 Use of quantitative decision and business analysis to solve engineering management issues
- 4.3 Application of quantitative project management skills

**MASTER OF SCIENCE IN ENGINEERING MANAGEMENT 31 HRS.**

**PROGRAM REQUIREMENTS 31 HOURS**

**BUSINESS COMMUNICATIONS 4 HRS.**

ENG	501	Research and Writing Skills For Professional Success	(1)
LDR	5223	Organizational Communications for Leaders	(3)

**BUSINESS MANAGEMENT AND STRATEGY 6 HRS.**

HR	5923	Strategic Human Resource Management	(3)
LDR	5203	Leadership Ethics, Culture, and Politics	(3)

**FINANCE 6 HRS.**

FIN	503	Financial Analysis for Decision Makers	(3)
FIN	5063	Corporate Finance	(3)

**ACCOUNTING 3 HRS.**

FIN	6923	Managerial Accounting and Finance	(3)
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**ENGINEERING MANAGMENT 12 HRS.**

GE	5103	Project Management	(3)
GE	5113	New Product Development and Innovation Strategies	(3)
GE	5123	Lean Enterprise and Total Quality Management	(3)
MGT	543	Operations Strategy and Management	(3)

**TOTAL 31 HRS.**

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## MASTER OF SCIENCE WITH A MAJOR IN CRIMINAL JUSTICE

The Master of Science with a major in Criminal Justice (MSCJ) program 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 13 courses offered online or on campus that can be completed in 12 months. Courses consist of 8 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 in a social science field from regionally accredited colleges and universities and whose undergraduate work has been of sufficient quality and scope to enable them to successfully pursue graduate study.

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 SPS 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.

The MSCJ program offers four concentrations including:

- **Public Administration:** This concentration will give individuals the leadership skills necessary to be professional public managers and future faculty who will meet the challenges of public service. Specifically, it will prepare students to serve as managers in the executive arm of local, state, and federal government, as well as in nongovernmental organizations and nonprofit sectors.
- **Emergency Management:** This concentration will prepare students to lead in areas of mitigation, preparedness, response and recovery of international and/or natural disasters and emergencies. This program is designed for individuals interested in homeland security, community service positions, and disaster relief.

### Trine University

- **Forensic Psychology:** This concentration will prepare students to understand the behavioral and psychological tenants of deviant behavior, as well as the correlates and causations of crime. This program is designed for individuals interested in correctional counseling, investigative psychology, crisis intervention, police psychology, child protection psychology, victim psychology, sex offender psychology, and juvenile delinquency counseling.
- **Law:** This concentration is designed for individuals interested in working as leaders in local, state, and federal governmental agencies, nonprofit organizations, and private corporate settings, among others, whereby an in-depth understanding of the law is essential. Core areas of the law covered in this concentration include advanced employment law, criminal procedure, juvenile justice, constitutional law, and administrative law.

Students may also apply for the Certificate Program which is a stand-alone certificate in any of the concentration areas. This consists of six classes each for a total of 18 credit hours.

**MASTER OF SCIENCE WITH A MAJOR IN  
CRIMINAL JUSTICE**

**PROGRAM REQUIREMENTS**

**36 HRS.  
REQUIRED HOURS**

**CRIMINAL JUSTICE CORE 21 HRS.**

ENG	501 Research and Writing for Professional Success	(1)
CRJ	502 The American System of Justice	(2)
CRJ	503 Seminar in Law and Social Control	(3)
CRJ	513 Criminology	(3)
CRJ	533 Criminal Justice Policy Formation and Analysis	(3)
CRJ	553 Applied Statistics for Criminal Justice	(3)
CRJ	563 Planning, & Program Evaluation	(3)
CRJ	593 Demonstration Project Capstone	(3)

**Select one of the following concentrations: 15 HRS.**

**LAW CONCENTRATION 15 HRS.**

CRJ	643 Law and Public Policy	(3)
LAW	603 Advanced Employment Law	(3)
LAW	613 Advance Criminal Procedure: Investigation & Adjudication	(3)
LAW	623 Children and the Law	(3)
LAW	693 Law Concentration Demonstration Capstone	(3)

**EMERGENCY MANAGEMENT CONCENTRATION 15 HRS.**

EM	503 Advanced Principles of Emergency Management	(3)
EM	513 Seminar in Hazard Mitigation	(3)
EM	623 Comprehensive Risk Assessment & Vulnerability	(3)
EM	653 Managing Disaster Relief and Recovery Operations	(3)
EM	693 Public Administration Demonstration Project	(3)

**FORENSIC PSYCHOLOGY CONCENTRATION 15 HRS.**

FPY	603 Theory & Practice of Forensic Psychology	(3)
FPY	613 Psychopathology	(3)
FPY	623 Evaluation & Treatment of Specialized Populations	(3)
FPY	643 Victimology	(3)
FPY	693 Forensic Psychology Demonstration Project	(3)

**PUBLIC ADMINISTRATION CONCENTRATION 15 HRS.**

CRJ	603 Theory and Practice of Public Administration	(3)
CRJ	613 Public Organizational Behavioral & Human Resource Mang.	(3)
CRJ	623 Governmental Accounting Finance & Budgeting	(3)
CRJ	643 Law and Public Policy	(3)
CRJ	693 Public Administration Demonstration Project	(3)

**TOTAL 36 HRS.**

**CERTIFICATE PROGRAM**

Students may also apply for the Certificate Program which is a stand-alone certificate in any of the concentration areas. This consists of six classes each for a total of 18 credit hours.

**Emergency Management Concentration Certificate (18 Credit Hours)**

CRJ 563 Planning and Program Evaluation  
EM 503 Advanced Principles of Emergency Management  
EM 513 Seminar in Hazard Mitigation  
EM 623 Comprehensive Risk Assessment  
EM 653 Managing Disaster Relief  
EM 693 Emergency Management Demonstration Project

**Forensic Psychology Concentration Certificate (18 Credit Hours)**

CRJ 563 Planning and Program Evaluation  
FPY 603 Theory & Practice of Forensic Psychology  
FPY 613 Psychopathology  
FPY 623 Evaluation & Treatment of Specialized Populations  
FPY 643 Victimology  
FPY 693 Forensic Psychology Demonstration Project

**Law Concentration Certificate (18 Credit Hours)**

CRJ 563 Planning and Program Evaluation  
LAW 603 Advanced Employment Law  
LAW 613 Advanced Criminal Procedure: Investigation and Adjudication  
LAW 623 Children and the Law  
CRJ 643 Law and Public Policy  
LAW 693 Law Concentration Demonstration Capstone

**Public Administration Concentration Certificate (18 Credit Hours)**

CRJ 563 Planning and Program Evaluation  
CRJ 603 Theory and Practice of Public Administration  
CRJ 613 Public Organizational Behavior & Human Resource Management  
CRJ 623 Governmental Accounting, Finance & Budgeting  
CRJ 643 Law and Public Policy  
CRJ 693 Public Administration Demonstration Project

## **LOU HOLTZ MASTER OF SCIENCE IN LEADERSHIP**

The *Lou Holtz Master of Science in Leadership (MSL)* degree program at Trine offers adults holding bachelor's degrees in business, engineering, arts and sciences a new career dimension - leadership. Visionary, strategic leadership skills enhance success in all of these career areas.

Designed for working professionals, the MSL develops the theoretical and applied leadership knowledge, capabilities and characteristics needed to positively impact organizations across multiple sectors.

Concentrations may be pursued as stand-alone graduate certificates, preparing students for nationally recognized exams such as the Certified Global Business Professional, Regulatory Affairs Certification, and Leed Green Associate certification.

### Concentrations:

- Biomedical Regulatory Affairs
- Business Administration
- Healthcare Systems Studies
- Human Resource Management
- Instructional Leadership - Higher Education
- International Studies
- Nonprofit Organizational Studies
- Sport Management
- Strategic Foresight & Entrepreneurship
- Sustainable and Environmental Management

**LOU HOLTZ MASTER OF SCIENCE IN LEADERSHIP  
PROGRAM REQUIREMENTS**

**36 HRS.  
REQUIRED HOURS**

**LEADERSHIP CORE 21 HRS.**

ENG	501	Research and Writing Skills for Professional Success	(1)
LDR	5003	Leadership Philosophy	(3)
LDR	5023	Strategic Leadership	(3)
LDR	5043	Organizational Systems and Cultures	(3)
LDR	5062	Organizational Development and Change	(2)
LDR	5083	Conflict Resolution for Leaders	(3)
LDR	5203	Leadership Ethics, Culture, and Politics	(3)
LDR	5223	Organizational Communications for Leaders	(3)

**Select one of the following concentrations: 15 HRS.**

**BIOMEDICAL REGULATORY AFFAIRS CONCENTRATION 15 HRS.**

LDR	5333	Qualitative Decision Making – Capstone Proposal	(3)
RA	6103	Introduction to Biomedical Regulatory Affairs	(3)
RA	6123	Product Development and Manufacturing Systems	(3)
RA	6143	Product Testing, Evaluation, Clinical Trials, and Post-Market Issues	(3)
RA	6163	Biomedical Regulatory Affairs Capstone	(3)

**BUSINESS ADMINISTRATION CONCENTRATION 15 HRS.**

BA	6933	Statistics and Quantitative Methods	(3)
BA	6953	Managing Business Information Systems	(3)
BA	6963	Business Administration Capstone	(3)
FIN	6923	Managerial Accounting & Finance	(3)
MK	6943	Strategic Marketing Management	(3)

**HEALTHCARE SYSTEMS STUDIES CONCENTRATION 15 HRS.**

HC	6803	Leadership and Management of Healthcare Systems	(3)
HC	6823	Legal and Ethical Issues in Healthcare Leadership	(3)
HC	6843	Organization and Economics of Healthcare Delivery Systems	(3)
HC	6863	Healthcare Leadership Capstone	(3)
LDR	5333	Qualitative Decision Making – Capstone Proposal	(3)

**HUMAN RESOURCE MANAGEMENT CONCENTRATION 15 HRS.**

HR	5923	Strategic Human Resource Management	(3)
HR	5943	Certified Professional Human Resources Preparation	(3)
HR	5953	Global Compensation and Benefits	(3)
HR	5963	Human Resource Management Capstone	(3)
LDR	5333	Qualitative Decision Making – Capstone Proposal	(3)

**Trine University**

<b>INSTRUCTIONAL LEADERSHIP – HIGHER EDUCATION CONCENTRATION</b>		<b>15 HRS.</b>
HED	6513 Students and Stake holders in the Higher Education Environment	(3)
HED	6533 Teaching and Learning in Higher Education	(3)
HED	6553 Principles and Practices of Academic Advising	(3)
HED	6573 Instructional Leadership Capstone Course – Higher Education	(3)
LDR	5333 Qualitative Decision Making – Capstone Proposal	(3)
<b>INTERNATIONAL STUDIES CONCENTRATION</b>		<b>15 HRS.</b>
LDR	5333 Qualitative Decision Making – Capstone Proposal	(3)
MGT	6003 Fundamentals of Global Business Leadership	(3)
MGT	6023 International Marketing and Economics for Leaders	(3)
MGT	6043 Global Logistics and Supply Chain Management for Leaders	(3)
MGT	6063 International Studies Capstone	(3)
<b>NONPROFIT ORGANIZATIONAL STUDIES CONCENTRATION</b>		<b>15 HRS.</b>
BA	6203 Nonprofit Sector Foundations	(3)
BA	6243 Quantitative Methods for Nonprofit Organization Planning and Evaluation	(3)
BA	6263 Nonprofit Organization Studies Capstone	(3)
ECO	6223 Economic Sustainability of Nonprofit Organizations	(3)
LDR	5333 Qualitative Decision Making – Capstone Proposal	(3)
<b>SPORT MANAGEMENT CONCENTRATION</b>		<b>15 HRS.</b>
LDR	5333 Qualitative Decision Making – Capstone Proposal	(3)
SM	6713 Marketing Intercollegiate and Professional Athletes	(3)
SM	6733 Athletic Coaching	(3)
SM	6753 Administration of Athletics	(3)
SM	6763 Athletic Administration Capston 2	(3)
<b>STRATEGIC FORESIGHT &amp; ENTREPRENEURSHIP CONCENTRATION</b>		<b>15 HRS.</b>
ENT	6403 Fundamentals of Foresight and Entrepreneurship	(3)
ENT	6423 Feasibility Analysis for New Ventures	(3)
ENT	6443 Business and Marketing Plans for New Ventures	(3)
ENT	6463 Global Entrepreneurship Capstone	(3)
LDR	5333 Qualitative Decision Making – Capstone Proposal	(3)
<b>SUSTAINABLE AND ENVIRONMENTAL MANAGEMENT CONCENTRATION</b>		<b>15 HRS.</b>
BA	6603 Leading the Sustainable Business	(3)
BA	6643 Sustainability and Business Opportunity	(3)
LDR	5333 Qualitative Decision Making – Capstone Proposal	(3)
MGT	6623 Business Management and Environmental Leadership	(3)
MGT	6663 Sustainable Business Administration Capstone	(3)
<b>TOTAL</b>		<b><u>36 HRS.</u></b>

## **ADDITIONAL PROGRAMS LINKED TO TRINE GRADUATE PROGRAMS**

### **DPT 3 + 3 Degree Path**

Please see the School of Health Sciences for information on the 3 + 3 program. We offer a six year plan of study to qualified students leading to a bachelor's degree in either exercise science or biology and a Doctor in Physical Therapy.

### **ENGINEERING 4 +1 Degree Path**

Please see the Allen School of Engineering and Technology for information on the 4 + 1 program. We offer a five year plan of study to qualified students leading to a bachelor's degree and a Master's degree in Engineering.

### **BUSINESS 4 +1 Degree Path**

Please see the Ketner School of Business for information on the 4 + 1 program. We offer a five year plan of study to qualified students leading to a bachelor's degree and a Master's degree in Business.

### **CRIMINAL JUSTICE 4 +1 Degree Path**

Please see the Jannen School of Arts and Sciences for information on the 4 + 1 program. We offer a five year plan of study to qualified students leading to a bachelor's degree and a Master's degree in Criminal Justice.

## **TRINE UNIVERSITY MINORS**

- ACCOUNTING
- AERONAUTICAL ENGINEERING
- ATHLETIC TRAINING
- BIOLOGY
- BIOMEDICAL
- BIOPROCESS ENGINEERING
- BUSINESS
- CHEMISTRY
- COMMUNICATION
- CRIMINAL JUSTICE
- ECONOMICS
- ENERGY ENGINEERING
- ENTREPRENEURSHIP
- ENVIRONMENTAL ENGINEERING
- FINANCE
- GOLF MANAGEMENT
- HISTORY
- HUMANITIES
- INTERNATIONAL STUDIES
- LEADERSHIP
- MANAGEMENT
- MARKETING
- MATHEMATICS
- METALLURGICAL ENGINEERING
- MUSIC
- PLASTICS
- PSYCHOLOGY
- ROBOTICS
- SOFTWARE ENGINEERING
- STRUCTURAL ENGINEERING

<b>ACCOUNTING MINOR</b>			<b>24 HRS.</b>
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	Corporate Finance	(3)
Accounting or Finance Electives 300/400			(6)
<b>TOTAL IN MINOR PROGRAM</b>			<b>24 HRS.</b>

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**AERONAUTICAL ENGINEERING MINOR** **27 HRS.**

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 for all courses in the minor.

**REQUIRED ENGINEERING SCIENCE COURSES** **6 HRS.**

ES	253	Electrical Science	(3)
ES	343	Heat Transfer	(3)

**REQUIRED MATHEMATICS COURSE** **3 HRS.**

MA	313	Linear Algebra	(3)
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**REQUIRED MECHANICAL ENGINEERING COURSES** **18 HRS.**

MAE	3033	Fluid Dynamics for Mechanical Engineering	(3)
MAE	473	Applied Aerodynamics	(3)
MAE	483	Vehicle Structures	(3)
MAE	493	Aerodynamics Laboratory	(3)
MAE	4173	Gas Turbines	(3)
MAE	4183	Aircraft Stability and Control	(3)

**TOTAL IN MINOR PROGRAM** **27 HRS.**

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**ATHLETIC TRAINING MINOR**

**26 HRS.**

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 course work and training. Trine University does not certify athletic trainers.

EXS	243	Athletic Training	(3)
EXS	332	Drug Education	(2)
EXS	393	Advanced Athletic Training	(3)
EXS	403	Remedial Exercise & Rehabilitation	(3)
EXS	423	Evaluation of Athletic Injuries	(3)
EXS	443	Therapeutic Modalities	(3)
EXS	483	Internship in Sports Medicine	(3)
SM	393	Sport Psychology	(3)
SM	413	Organization & Administration of Athletics	(3)

**TOTAL IN MINOR PROGRAM: 26 HRS.**

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**BIOLOGY MINOR**

**24 HRS.**

(FOR A NON-EDUCATION STUDENT WITH ANOTHER MAJOR)

**12 HRS.**

BIO 114 Principles of Biology I (4)

BIO 124 Principles of Biology II (4)

CH 104 General Chemistry I

or

CH 104H Honors General Chemistry I (4)

One of the following physiology classes: **3-4 HRS.**

BIO 283 Marine Biology

BIO 304 Plant Biology

BIO 354 Animal Physiology

BIO 344 Cell Biology

BIO 404 Embryology

One of the following ecology classes: **4 HRS.**

BIO 211 Conservation lab

and

BIO 213 Conservation

or

BIO 274 General Ecology

or

BIO 334 Environmental Biology

One of the following organism classes: **3-4 HRS.**

BIO 283 Marine Biology

BIO 304 Plant Biology

BIO 314 Animal Biology

BIO 324 Microbiology

Additional BIO courses to bring the total to 24 credit hours. **0-3 HRS.**

**TOTAL IN MINOR PROGRAM: 24 HRS.**

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**BIOMEDICAL ENGINEERING MINOR 27 HRS.**

**REQUIRED BIOMEDICAL COURSES 18 HRS.**

BME	114	Intro to Biomedical Engineering	(4)
BIO	254	Human Anatomy	(4)
BIO	354	Human Physiology	(4)
BME	4103	Intro to Biomechanics	(3)
BME	4203	Intro to Biomaterials	(3)

**REQUIRED ENGINEERING SCIENCE COURSES 9 HRS.**

ES	223	Dynamics	(3)
ES	233	Engineering Materials	(3)
Choose one of the following two (2) options			
ES	243	Solid Mechanics	
Or one of:			
ES	253	Electrical Science	
ECE	213	Circuit Analysis	(3)

**TOTAL IN MINOR PROGRAM: 27 HRS.**

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**BIOPROCESS ENGINEERING MINOR 24-25 HRS.**

There has been an increased focus on biological engineering techniques utilized by industries that include, but are not limited to, pharmaceuticals, food processing, consumer products, agricultural and biotechnology firms. 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.

**REQUIRED SCIENCE COURSES 12 HRS.**

CH	203	Organic Chemistry I	(3)
CH	211	Organic Chemistry I Laboratory	(1)
BIO	324	Microbiology	(4)
BIO	434	Biochemistry	(4)

**REQUIRED ENGINEERING COURSES 9 HRS.**

CHE	303	ChE Fluid Dynamics	
or			
ES	323	Fluid Mechanics	(3)
CHE	4073	Biochemical Engineering	(3)
CHE	4173	Bio-Separations Processes	(3)

**ADVANCED BIO-ELECTIVE (DEPARTMENTAL APPROVAL NEEDED) 3-4 HRS.**

**TOTAL IN MINOR PROGRAM: 24-25 HRS.**

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**BUSINESS MINOR**

**24 HRS.**

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.

AC	203	Accounting I	(3)
AC	213	Accounting II	(3)
BA	123	Business Concepts	(3)
FIN	303	Managerial Finance	(3)
LAW	203	Business Law I	(3)
MGT	363	Organizational Behavior	(3)
MK	203	Marketing	(3)

ELECTIVES (3)

Choose courses prefixed by AC, BA, ENT, FIN, LAW MGT, and/or MK

**TOTAL IN MINOR PROGRAM: 24 HRS.**

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**CHEMISTRY MINOR**

**24 HRS.**

(FOR NON-EDUCATION STUDENTS WITH ANOTHER MAJOR)

CH	104	General Chemistry I	
or			
*CH	104H	Honors General Chemistry I	(4)
CH	114	General Chemistry II	
or			
CH	114H	Honors General Chemistry II	(4)
CH	234	Quantitative Chemical Analysis	(4)
Chemistry electives			(12)

**TOTAL IN MINOR PROGRAM: 24 HRS.**

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**COMMUNICATION MINOR**

**24 HRS.**

(FOR A STUDENT WITH ANOTHER MAJOR)

*COM	153	Principles of Public Relations	(3)
*COM	163	Interpersonal Communication	(3)
*SP	203	Effective Speaking	(3)

Electives in COM, FLM, SP courses, or ENG 133, and MK 323 or MK 463, with at least 6 hours of COM prefix courses at the 300-level or above. (15)

**TOTAL IN MINOR PROGRAM: 24 HRS.**

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<b>CRIMINAL JUSTICE MINOR</b>			<b>27 HRS.</b>
(FOR A STUDENT WITH ANOTHER MAJOR)			
LE	103	Introduction to Criminal Justice	(3)
LE	253	Probation, Parole & Community Corrections	(3)
LE	263	Introduction to Criminal Law and Justice	(3)
LE	273	Criminal Procedures and Evidence	(3)
LE	343	Criminalistics and Crime Scene Investigations I	(3)
PSY	383	Forensic Psychology	(3)
Law enforcement and/or psychology electives			(9)
<b>TOTAL IN MINOR PROGRAM:</b>			<b>27 HRS.</b>

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<b>ECONOMICS MINOR</b>			<b>27 HRS.</b>
ECO	213	Microeconomics	(3)
ECO	223	Macroeconomics	(3)
ECO	323	Money and Banking	(3)
ECO	363	Comparative Economic Systems	(3)
ECO	383	International Economics	(3)
Economics and/or finance electives			(12)
<b>TOTAL IN MINOR PROGRAM:</b>			<b>27 HRS.</b>

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**ENERGY ENGINEERING MINOR** **27 HRS.**

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.

<b>REQUIRED ENGINEERING SCIENCE COURSES</b>			<b>(12)</b>
ES	213	Statics	(3)
ES	223	Dynamics	(3)
ES	233	Engineering Materials	(3)
ES	313	Thermodynamics	(3)
<b>REQUIRED MECHANICAL ENGINEERING COURSES</b>			<b>(3)</b>
MAE	4023	System Dynamics and Controls	(3)
<b>REQUIRED ELECTRICAL ENGINEERING COURSES</b>			<b>(12)</b>
ECE	213	Circuit Analysis	
OR			
ES	253	Electrical Science	(3)
ECE	303	Electrical Machines	(3)
ECE	313	Electrical Power	(3)
ECE	403	Direct Generation Techniques	(3)
<b>TOTAL IN MINOR PROGRAM:</b>			<b>27 HRS.</b>

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**ENTREPRENEURSHIP MINOR for Business Students 24HRS.**

The entrepreneurship minor is designed for students who are interested in starting a business. Open to students from any Trine University 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.

**PROGRAM REQUIREMENTS 24 HRS.**

ENT	303	Entrepreneurial Leadership	(3)
ENT	413	Creativity in Product/Service Development	(3)
ENT	423	Entrepreneurship & Venture Planning	(3)
FIN	323	Money and Banking	(3)
FIN	333	Venture Finance	(3)
MGT	463	Small Business Management	(3)

**Select 6 hours/2 courses from list: (6)**

FIN	353	Personal Finance
MGT	333	Supervision
MGT	313	Human Resource Management
MGT	443	Managing Operations
MK	473	E-Marketing
MK	463	Marketing Research
MK	423	Personal Selling
MK	363	Buyer Behavior

**TOTAL IN MINOR PROGRAM: 24 HRS.**

The choice of electives should reflect the student’s area of entrepreneurial interest.

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**ENTREPRENEURSHIP MINOR for Non-Business Students 24HRS.**

The entrepreneurship minor is designed for non-business students.

**PROGRAM REQUIREMENTS 24 HRS.**

AC	203	Accounting I	(3)
BA	123	Business Concepts	(3)
ENT	303	Entrepreneurial Leadership	(3)
ENT	413	Creativity in Product/Service Development	(3)
ENT	423	Entrepreneurship & Venture Planning	(3)
LAW	203	Business Law I	(3)
MK	203	Marketing	(3)

**Select 3 hours/ 1 course from list: (3)**

FIN	353	Personal Finance
MGT	333	Supervision
MGT	313	Human Resource Management
MGT	443	Managing Operations
MK	473	E-Marketing
MK	463	Marketing Research
MK	423	Personal Selling
MK	363	Buyer Behavior

**TOTAL IN MINOR PROGRAM: 24 HRS.**

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**CIVIL ENGINEERING**

**ENVIRONMENTAL ENGINEERING MINOR**

**27 HRS.**

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.

**REQUIRED SCIENCE COURSES**

**11 HRS.**

CH	104	General Chemistry I	
or			
CH	104H	Honors General Chemistry I	(4)
CH	114	General Chemistry II	
or			
CH	114H	Honors General Chemistry II	(4)
ES	323	Fluid Mechanics or equivalent (i.e. CHE 303 ChE Fluid Dynamics)	(3)

**REQUIRED ENVIRONMENTAL ENGINEERING BREADTH COURSES**

**7 HRS.**

CE	4103	Environmental Engineering (Non-Aqueous)	(3)
CE	3101	Environmental Engineering Lab	(1)
CE	3103	Environmental Engineering (Aqueous)	(3)

**CHOOSE THREE OF THE FOLLOWING 3-CREDIT COURSES**

**ENVIRONMENTAL ENGINEERING DEPTH COURSES**

**9 HRS.**

CE	4113	Hazardous Waste Engineering	
CE	4123	Water Treatment Principles and Design	
CE	4133	Wastewater Treatment Principles and Design	
CE	4323	Engineering Hydrology	
or			
CE	4313	Water Resources and Water Power Engineering	
or			
CE	4333	Water Distribution and Design of Sewers	
or			
CE	4303	Open Channel Hydraulics	
CHE	4043	Air Environmental Control	
CHE	453	Chemical Engineering Kinetics	
CHE	4073	Biochemical Engineering	
CHE	4083	Plant Management	

**TOTAL IN MINOR PROGRAM:**

**27 HRS.**

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Trine University

*With careful planning, the majority of requirements for admission to most MBA programs may be met with this minor.*

<b>FINANCE MINOR</b>			<b>24 HRS.</b>
AC	303	Cost Accounting	(3)
AC	423	Income Tax	(3)
FIN	323	Money and Banking	(3)
FIN	343	International Finance	(3)
FIN	353	Personal Finance	(3)
FIN	403	Investments	(3)
FIN	413	Corporate Finance	(3)
FIN	473	Financial Modeling	(3)
<b>TOTAL IN MINOR PROGRAM:</b>			<b>24 HRS.</b>

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<b>GOLF MANAGEMENT MINOR</b>			<b>24 HRS.</b>
GM	101	Introduction to Golf Management	(1)
GM	131	Player Development I	(1)
GM	203	Golf Shop Management	(3)
GM	213	Golf Club Design, Repair and Fitting	(3)
GM	231	Player Development II	(1)
GM	233	Internship	(3)
GM	303	Teaching the Short Game	(3)
GM	323	Teaching the Golf Swing	(3)
GM	343	Golf Facility Operations	(3)
GM	411	Food and Beverage Management	(1)
GM	452	Golf Management Leadership	(2)
<b>TOTAL IN MINOR PROGRAM:</b>			<b>24 HRS.</b>

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<b>HISTORY MINOR</b>			<b>27 HRS.</b>
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			(15)
<b>TOTAL IN MINOR PROGRAM:</b>			<b>27 HRS.</b>

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**HUMANITIES MINOR**

**25 HRS.**

**HUMANITIES CAPSTONE REQUIREMENT**

**1 HR.**

HUM 401 Humanities Portfolio

(1)

**HUMANITIES APPRECIATION COURSES**

**9 HRS.**

Choose nine (9) hours from:

(9)

ARC 293 Architecture Appreciation

ART 253 Art Appreciation

ENG 153 Introduction to Literature

FLM 203 Film Appreciation

MUS 272 Music Appreciation

SP 103 Introduction to Theater

One (1) course in a Foreign Language (Chinese/French/Spanish)

**HUMANITIES CONDITION COURSES**

**3 HRS.**

Choose three (3) hours from:

(3)

COM 233 Intercultural Communication

ENG 433 Shakespeare

GEO 303 Human Geography

PHL 313 Ethics

WS 103 Intro to Women's Studies

**FOCUS AREA**

**12HRS.**

Choose four (4) courses from one of the following foci.

(12)

**Music**

MUS 113 Music Theory I

MUS 123 Music History and Literature I

MUS 213 Music Theory II

MUS 223 Music History and Literature II

**Literature\***

ENG 233 Mythology

ENG 253 Readings in World Literature

ENG 273 Creative Writing

ENG 363 The English Language

\*Or substitute another approved 200 or above level course in literature.

**Philosophy**

PHL 203 Introduction to Philosophy

PHL 323 Philosophy of Religion

PHL 333 Art, Technology, and Society

PHL 343 Logic

**TOTAL IN MINOR PROGRAM:**

**25 HRS.**

**INTERNATIONAL STUDIES MINOR**

**24 HRS.**

COM 233 Intercultural Communication (3)

and

1 year of foreign language at the college level (6)

Choose five courses from the following ten courses (15) (15)  
(must include at least one course from each group)

**Geographic and Historical Perspectives**

GEO 303 Human Geography

GEO 323 World Geography

GOV/GEO 353 Political Geography

HIS/GOV 323 The Contemporary World

GOV 313 Comparative Governments

**Business Perspectives**

BA 343 International Business

ECO/GEO 343 Economic Geography

ECO 363 Comparative Economic Systems

ECO 383 International Economics

MK 343 International Marketing

**TOTAL IN MINOR PROGRAM:**

**24 HRS.**

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<b>LEADERSHIP MINOR</b>	<b>27 HRS.</b>
<b>CORE CLASSES</b>	<b>18 HRS.</b>
LDR 203 Leadership Strengths and Skills	(3)
LDR 303 Contemporary Leadership Theory & Practice	(3)
PHL 313 Ethics	(3)
LDR 403 Creativity, Innovation, and Influence	(3)
LDR 433 Leadership Practicum	(3)
PSY 113 Principles of Psychology	(3)

<b>LEADERSHIP ELECTIVES</b>	<b>9 HRS.</b>
Choose three courses (9 hrs) from the following:	(9)

BA 333 Social Media for Business	
COM 213 Business Communication	
COM 233 Intercultural Communication	
COM 363 Persuasion and Argumentation	
COM 413 Corporate & Organizational Communication	
ENT 303 Entrepreneurial Leadership	
GOV 343 American Political Thought	
GOV 373 Political Psychology	
MGT 313 Human Resource Management	
MGT 333 Supervision	
MGT 343 Human Resource Development	
MGT 363 Organizational Behavior	
MGT 413 Management of Quality	
MGT 443 Managing Operations	
MGT 453 Strategic Management	
PSY 333 Principles of Personality	
PSY 343 Social Psychology	
PSY 373 Political Psychology	
SM 313 Sport and Rec Management	
SM 393 Sport Psychology	
SM 413 Organization and Administration of Athletics	

<b>TOTAL IN MINOR PROGRAM:</b>	<b>27 HRS.</b>
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<b>MANAGEMENT MINOR</b>	<b>24 HRS.</b>
BA 403 Business and Public Policy	(3)
ENT 303 Entrepreneurial Leadership	
Or	
MGT 323 Leadership	(3)
MGT 313 Human Resources Management	(3)
MGT 413 Management of Quality	(3)
MK 363 Buyer Behavior	(3)
MK 423 Personal Selling	(3)
Management electives	(6)
<b>TOTAL IN MINOR PROGRAM:</b>	<b>24 HRS.</b>

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<b>MARKETING MINOR</b>			<b>24 HRS.</b>
BA	403	Business and Public Policy	(3)
ENT	303	Entrepreneurial Leadership	(3)
MK	323	Integrated Marketing Communications	(3)
MK	363	Buyer Behavior	(3)
MK	423	Personal Selling	(3)
MK	433	Marketing Management	(3)
Marketing electives			(6)
<b>TOTAL IN MINOR PROGRAM:</b>			<b>24 HRS.</b>

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<b>MATHEMATICS MINOR</b>			<b>25 HRS.</b>
(FOR STUDENTS WITH ANOTHER MAJOR)			
MA	134	Calculus I	(4)
MA	164	Calculus II	(4)
MA	213	Calculus III	(3)
MA	233	Differential Equations	(3)
MA	313	Linear Algebra	(3)
Mathematics Electives at the 300-400 level			(8)
A grade of "C" or higher is required for each mathematics course in the minor.			
<b>TOTAL IN MINOR PROGRAM:</b>			<b>25 HRS.</b>

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**METALLURGICAL ENGINEERING MINOR** **28 HRS.**

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 all courses in the minor.

<b>REQUIRED SCIENCE COURSE</b>			<b>4 HRS.</b>
CH	104	General Chemistry I	
or			
CH	104H	Honors General Chemistry I	(4)
<b>REQUIRED ENGINEERING SCIENCE COURSE</b>			<b>3 HRS.</b>
ES	233	Engineering Materials	(3)
<b>REQUIRED MATHEMATICS COURSE</b>			<b>3 HRS.</b>
MA	393	Probability and Statistics	(3)
<b>REQUIRED MECHANICAL ENGINEERING COURSES</b>			<b>18 HRS.</b>
MAE	243	Manufacturing Processes and Equipment	(3)
MAE	383	Metallurgical Thermodynamics	(3)
MAE	393	Metallurgical Transport	(3)
MAE	443	Engineering Metallurgy	(3)
MAE	4143	Physical Metallurgy	(3)
MAE	4193	Metal Casting	(3)
<b>TOTAL IN MINOR PROGRAM</b>			<b>28 HRS.</b>

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**MUSIC MINOR**

**24 HRS.**

MUS	111	Piano Class	(1)
MUS	113	Music Theory I	(3)
MUS	123	Music History I	(3)
MUS	213	Music Theory II	(3)
MUS	223	Music History II	(3)
MUS	253	Beginning Conducting	(3)

**SELECT APPLIED STUDIES**

**4 HRS.**

MUS	1011	Applied Studies (Woodwind, Brass, Percussion, String, Voice)	(1)
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**SELECT ENSEMBLE STUDIES**

**4 HRS.**

Choose from:

MUS	1141	Chamber Orchestra	(1)
MUS	1151	Marching Band	(1)
MUS	1161	Wind Ensemble/Pep Band	(1)
MUS	1171	University Choir	(1)
MUS	1181	Jazz Band	(1)
MUS	1191	Trine Chorale	(1)

**TOTAL IN MINOR PROGRAM:**

**24 HRS.**

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**PLASTICS ENGINEERING MINOR**

**25 HRS.**

Available to all Engineering and Technology students.

**REQUIRED CORE COURSES**

ETD	353	Thermodynamics and Heat Transfer for Technologists	(3)
PET	223	Polymer Structure, Properties & Applications	(3)
PET	224	Plastics Processing and Testing	(4)
PET	323	Plastics Product Design	(3)
PET	333	Plastics Mold Engineering and Design	(3)

**ELECTIVES (CHOOSE THREE)**

**(9)**

ETD	313	Design for Manufacturing Assembly
ETD	433	Computer Numerical Control
GE	413	Design of Experiments
GE	313	SPC and Lean Manufacturing
MGT	413	Management of Quality

**TOTAL IN MINOR PROGRAM:**

**25 HRS.**

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<b>PSYCHOLOGY MINOR</b>	<b>27 HRS.</b>
PSY 113 Principles of Psychology	(3)
Any 300 level or higher psychology courses or SOC 313, SOC 323, SOC 343, LE 153, or LE 453.	(24)
<b>TOTAL IN MINOR PROGRAM:</b>	<b>27 HRS.</b>

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**ROBOTICS MINOR** **29 HRS.**

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 all courses in the minor.

<b>REQUIRED COMPUTER SCIENCE COURSE</b>	<b>3 HRS.</b>
CS 1113 Object-Oriented Java	(3)

<b>REQUIRED ENGINEERING SCIENCE COURSES</b>	<b>12 HRS.</b>
ES 213 Statics	(3)
ES 223 Dynamics	(3)
ES 243 Solid Mechanics	(3)
ES 253 Electrical Science	
or	
ECE 213 Circuit Analysis	(3)

<b>REQUIRED ELECTRICAL ENGINEERING COURSES</b>	<b>11 HRS.</b>
ECE 103 Prototyping and Projects	(3)
ECE 263 Digital Systems	(3)
ECE 261 Digital Systems Laboratory	(1)
ECE 273 Microcontrollers	(3)
ECE 271 Microcontrollers Laboratory	(1)

<b>REQUIRED MECHANICAL ENGINEERING COURSE</b>	<b>3 HRS.</b>
MAE 363 Mechatronics	(3)

<b>TOTAL IN MINOR PROGRAM</b>	<b>29 HRS.</b>
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**SOFTWARE ENGINEERING MINOR 24 HRS.**

**REQUIRED COMPUTER SCIENCE COURSE 15 HRS.**

CS	1113	Object-Oriented Java	(3)
CS	1123	C++ and Object-Oriented Design	(3)
CS	2103	Algorithm Design and Analysis	(3)
CS	2503	Software Engineering	(3)
CS	3933	Software Analysis & Design	(3)

**REQUIRED BUSINESS COURSES 3 HRS.**

ENT	313	Business Concepts	(3)
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**ELECTIVE COURSES FROM CS LEVEL 3000/4000 6 HRS.**

CS	3303	Net-Centric Computing	
CS	3883	Computer Security	
CS	4033	Special Topics	
CS	4103	Advanced Software Development	

**TOTAL IN MINOR PROGRAM 24 HRS.**

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**CIVIL ENGINEERING**

**STRUCTURAL ENGINEERING MINOR ...PLEASE SEE NEXT PAGE**

**CIVIL ENGINEERING**

**STRUCTURAL ENGINEERING MINOR**

**27 HRS.**

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.

**REQUIRED ENGINEERING SCIENCE COURSES**

**6 HRS.**

ES	223	Dynamics	(3)
ES	243	Solid Mechanics	(3)

**REQUIRED STRUCTURAL ENGINEERING BREADTH COURSES**

**15 HRS.**

CE	3201	Civil Engineering Materials Laboratory	(1)
CE	3203	Civil Engineering Materials	(3)
CE	3501	Structural Analysis Lab	(1)
CE	3503	Structural Analysis	(3)
CE	3521	Structural Design Lab	(1)
CE	3523	Introduction to Structural Design	(3)
CE	4523	Advanced Structural Design	(3)

**STRUCTURAL ENGINEERING DEPTH COURSES**

**6 HRS.**

(Choose two of the following 3-credit courses)			(6)
MAE	453	Mechanical Vibrations	
CE	4553	Timber Design	
CE	4563	Bridge Engineering	
CE	4713	Foundation Engineering	

**TOTAL IN MINOR PROGRAM**

**27 HRS.**

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## **ALLEN SCHOOL OF ENGINEERING & TECHNOLOGY**

**Trine University's Allen School of Engineering & Technology includes these Departments:**

- DEPARTMENT OF BIOMEDICAL ENGINEERING
- MCKETTA DEPARTMENT OF CHEMICAL & BIOPROCESS ENGINEERING
- REINERS DEPARTMENT OF CIVIL & ENVIRONMENTAL ENGINEERING
- DEPARTMENT OF ELECTRICAL & COMPUTER ENGINEERING
- WADE DEPARTMENT OF MECHANICAL, AEROSPACE & BIOMEDICAL ENGINEERING
- DEPARTMENT OF TECHNOLOGY

**Academic programs administered by the school are as follows:**

MASTER OF SCIENCE IN ENGINEERING MANAGEMENT (co-offered with Ketner School of Business)

MASTER OF ENGINEERING WITH A MAJOR IN:

- CIVIL ENGINEERING

BACHELOR OF SCIENCE IN BIOMEDICAL ENGINEERING

BACHELOR OF SCIENCE IN CHEMICAL ENGINEERING

BACHELOR OF SCIENCE IN CIVIL ENGINEERING

BACHELOR OF SCIENCE IN COMPUTER ENGINEERING

BACHELOR OF SCIENCE IN DESIGN ENGINEERING TECHNOLOGY

BACHELOR OF SCIENCE IN ELECTRICAL ENGINEERING

BACHELOR OF SCIENCE IN MECHANICAL ENGINEERING

### **4+1**

The integrated bachelor's and master's program best serves the high school senior who values the idea of completing their undergraduate and graduate studies within five years.

**The following bachelor degrees are available to start on the 4 + 1 degree path:**

- CIVIL ENGINEERING

### **MINORS IN:**

- AERONAUTICAL ENGINEERING
- BIOMEDICAL ENGINEERING
- BIOPROCESS ENGINEERING
- ENERGY ENGINEERING
- ENVIRONMENTAL ENGINEERING
- METALLURGICAL ENGINEERING
- ROBOTICS
- SOFTWARE ENGINEERING
- STRUCTURAL ENGINEERING
- PLASTICS ENGINEERING

## **THE SCHOOL**

The Drs. Jerry and Jorja Allen School of Engineering & Technology 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 & Technology 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 & Technology 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 & Technology 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, electrical engineering, computer engineering, and mechanical engineering are accredited by the Engineering Accreditation Commission of ABET, [www.abet.org](http://www.abet.org), 410.347.7700.

## **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.

**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	
		or	
CH	104H	Honors General Chemistry I	(4)
ENG	103	English Composition I	(3)
GE	101	Introduction to Engineering	(1)
MA	134	Calculus I	(4)
		Social Sciences & Humanities elective	(3)

**SECOND SEMESTER** **15-18 HRS.**

ENG	133	Technical Communication	(3)
MA	164	Calculus II	(4)
PH	224	University Physics I	(4)
		Social Sciences & Humanities elective	(3)
		Engineering or Science course	(1-4)

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**DEPARTMENT OF BIOMEDICAL ENGINEERING**  
**THE BIOMEDICAL ENGINEERING CURRICULUM**

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 vision of the Allen School of Engineering.

**BACHELOR OF SCIENCE IN BIOMEDICAL ENGINEERING** **132 HRS**

	Mathematics	Science	Hum/SS	Communication	Other
General Education 42 hours	MA 134 MA 164	CH 155H PH 224 PH 234	<u>12 hours</u> PHL 313 HUM elective SS elective SS elective	ENG 103 ENG 133 SP 203	
Additional Requirement 21 hours	MA 213 MA 233 MA 39	CH 203 CH 211 BIO 254 BIO 354			
Core Requirements 69 hours	<p><b><u>General Engineering: 2 hours</u></b>                      GE 101 Introduction to Engineering                      GE 401 Professional Practice</p> <p><b><u>Unrestricted Electives: 1 hour</u></b></p> <p><b><u>Engineering Science: 14 hours</u></b>                      ES 213 Statics                      ES 223 Dynamics                      ES 233 Engineering Materials                      ES 382 Engineering Economics                      ES 313 Thermodynamics <i>or</i> CHE 313 Thermodynamics</p> <p><b><u>ELECTRICAL/COMPUTER ENGINEERING: 7 hours</u></b>                      ECE 213 Circuit Analysis                      ECE 211 Circuit Analysis Lab                      ECE 243 Analog Signals</p> <p><b><u>BME CORE: 27 hours</u></b>                      BME 2013 Introduction to Biomedical Engineering                      BME 3003 Introduction to Biomechanics                      BME 3103 Biomaterials                      BME 4303 Biochemical Engineering                      BME 4403 BME Measurement/Instrumentation                      BME 4503 Tissue Engineering                      BME 4603 BME Transport I                      BME 4853 BME Design I                      BME 4863 BME Design II</p>				
	<p><b>Choose one (1) of the following three concentration areas</b></p>				

Trine University

	<b>CHEMICAL ENGINEERING CONCENTRATION: 18 hours</b> CHE 203 Material Balances CHE 212 Energy Balances CHE 252 Statistics and Computational Methods CHE 303 ChE Fluids CH 213 Organic Chemistry II CH 221 Organic Chemistry II Lab BIO 434 Biochemistry
	<b>ELECTRICAL ENGINEERING CONCENTRATION: 18 hours</b> CS 1113 Object Oriented JAVA ECE 263 Digital Systems ECE 261 Digital Systems Lab ECE 233 Discrete Electronics ECE 231 Discrete Electronics Lab ECE 273 Microcontrollers ECE 271 Microcontrollers Lab ECE 323 Electromagnetic Fields
	<b>MECHANICAL ENGINEERING CONCENTRATION: 18 hours</b> EGR 143 Engineering Graphics MAE 203 Mechanical Engineering Analysis ES 243 Solid Mechanics BME 4003 Advanced Biomechanics BME 4613 Biomedical Transport II MAE XX3 MAE Elective

**TOTAL IN DEGREE PROGRAM:**

**132 HRS.**

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STUDENTS CAN EARN A DUAL DEGREE IN BIOMEDICAL WITH A CONCENTRATION IN FIELDS OF CHEMICAL ENGINEERING, ELECTRICAL ENGINEERING, OR MECHANICAL ENGINEERING WITH THE ADDITION OF THE COURSES LISTED ON THE FOLLOWING PAGE.

**DUAL DEGREE IN BIOMEDICAL ENGINEERING WITH A CONCENTRATION IN:**

**CHEMICAL ENGINEERING**

**30 HRS.**

	<p><b>DUAL DEGREE WITH CHEMICAL ENGINEERING (30)</b>                  CHE 222 Sustainability &amp; Process Measurement Lab                  CHE 333 Units Operations Lab I                  CHE 412 Applied Numerical Methods                  CHE 433 Units Operations Lab II                  CHE 453 Chemical Engineering Kinetics                  CHE 463 Chemical Engineering Process Dynamics &amp; Control</p> <p>CH XXX CH Electives (12)</p> <p>Unrestricted Electives (2)</p>
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**ELECTRICAL ENGINEERING**

**30 HRS.**

	<p><b>DUAL DEGREE WITH ELETRICAL ENGINEERING (30)</b>                  ECE 301 Electrical Machines Lab                  ECE 303 Electrical Machines                  ECE 453 Random Process in ECE                  ECE 481 Instrument Systems Lab                  ECE 483 Instrument Systems                  ECE 4001 Contemporary Issues For Engineers</p> <p>EE Concentration Electives (12)</p> <p>Advanced Mathematics Elective (3)</p> <p>Unrestricted Electives (3)</p>
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**MECHANICAL ENGINEERING**

**30 HRS.**

	<p><b>DUAL DEGREE WITH MECHANICAL ENGINEERING (30)</b>                  ES 343 Heat Transfer                  MA 313 Linear Algebra                  MAE 243 Manufacturing Process and Equipment                  MAE 323 Thermodynamics II                  MAE 353 Machine Component Design                  MAE 373 Computer Aided Machine Design                  MAE 3033 Fluids Dynamics                  MAE 413 Thermo/Fluid Component Design</p> <p>MAE 453 Mechanical Vibrations                  Or                  MAE 4023 System Dynamics and Controls</p> <p>MAE 463 Mechanical Measurements</p>
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## **MCKETTA DEPARTMENT OF CHEMICAL & BIOPROCESS ENGINEERING**

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](http://www.abet.org), 410.347.7700.

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. The chemistry studied by the chemical engineer may include quantitative analysis, organic chemistry, physical or biochemistry and instrumental analysis. These are the same courses that a chemist would be required to take. The chemical engineer takes these chemical principles and applies them to industrial processes.

Chemical engineering has many common elements with the other engineering disciplines. It is based upon the fundamentals of physics and mathematics. It shares the core engineering sciences of mechanics, fluid flow, heat transfer, thermodynamics, and economics. Oral and written communication skills and interpersonal skills are required for success.

Engineering design is an integral component in chemical engineering course work. Solution of open-ended problems and the design process are introduced in the department's freshman engineering course. Design of experiments is covered in the Unit Operations laboratories, and equipment and process design concepts are taught through the Unit Operations and Chemical Engineering Kinetics courses. This work culminates in the capstone courses Chemical Process Design I and Chemical Process Design II.

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

## Trine University

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 learning environment in which students receive personal mentoring through small classes and excellent teaching. The program prepares graduates to succeed, lead and provide service to their employers, profession and society.

### **OBJECTIVES**

To meet this mission, a graduate from the McKetta Department of Chemical & Bioprocess Engineering must be:

1. Technically Competent – Alumni will be considered to be technically competent, well prepared leaders in their professions as well as non-work related endeavors.
2. A Problem Solver and Designer with Communication and Team Skills - Graduates will provide valuable service to their community, professional organizations and the University through their creative problem solving ability and their strong communication and team skills.
3. Professionally Obligated - Alumni will demonstrate professional responsibility and lifelong learning as evidenced by 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:

- A. apply knowledge of mathematics, science, and engineering;
- B. design and conduct experiments, as well as to analyze and interpret data ;
- C. design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability;
- D. function on multidisciplinary teams;
- E. identify, formulate, and solve engineering problems ;
- F. demonstrate professional and ethical responsibility;
- G. communicate effectively;
- H. use the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context;
- I. recognize the need for, and an ability to engage in, life-long learning;
- J. discuss contemporary issues;
- K. use the techniques, skills, and modern engineering tools, necessary for engineering practice; and
- L. demonstrate knowledge of hazards associated with chemical, biological and physical processes and be able to recognize, evaluate, minimize and control these hazards.

## THE CHEMICAL ENGINEERING CURRICULUM

The curriculum requires the completion of 132 hours of course work. The average course load is 16-17 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.

### BACHELOR OF SCIENCE IN CHEMICAL ENGINEERING 132 HRS.

	Mathematics	Science	Hum/SS	Communication	Other
General Education 43 hours	MA 134 MA 164 MA 213 MA 233	PH 224 PH 234	<u>12 hours:</u> HUM elective (3) HUM elective (3) ECO 213 (or 223) SS elective (3)	ENG 103 ENG 133 SP 203	
Additional Requirements 28 hours		CH 104 and 114 <i>or</i> CH 155H  CH 203 CH 211 CH Elective (12 hrs)			4 or 7 cr. hrs. free electives
Core Requirements 61 hours	<p><b><u>General Engineering : 2 hours</u></b>                      GE 101 Introduction to Engineering                      GE 401 Professional Practice</p> <p><b><u>Engineering Science: 5 hours</u></b>                      ES 233 Engineering Materials                      ES 382 Engineering Economics</p> <p><b><u>Chemical Engineering Concentration: 54 hours</u></b>                      CHE 122 Introduction to Chemical &amp; Biological Engineering                      CHE 203 Material Balances                      CHE 212 Energy Balances                      CHE 222 Process Measurement Lab and Sustainability                      CHE 252 Statistics and Computational Methods                      CHE 303 Chemical Engineering Fluid Dynamics                      CHE 313 Chemical Engineering Thermodynamics I                      CHE 333 Unit Operations Laboratory I                      CHE 372 Chemical Engineering Thermodynamics II                      CHE 373 Chemical Engineering Heat Transfer                      CHE 383 Mass Transfer                      CHE 393 Stagewise Separations                      CHE 412 Applied Numerical Methods                      CHE 433 Unit Operations Laboratory II                      CHE 453 Chemical Engineering Kinetics                      CHE 463 Chemical Engineering Dynamics and Control                      CHE 473 Chemical Engineering Design I                      CHE 483 Chemical Engineering Design II                      Chemical Engineering Electives (6) credits</p>				

**TOTAL IN DEGREE PROGRAM:**

**132 HRS.**

## **REINERS DEPARTMENT OF CIVIL & ENVIRONMENTAL ENGINEERING**

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](http://www.abet.org), 410.347.7700.

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, and construct 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 do 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 & Technology and Trine University, will excel in the education of individuals uniquely prepared for the practice of civil engineering at the professional level.

Civil engineers, individually, cannot be accomplished in all of the above areas. Therefore, they concentrate on specific areas of civil engineering, such as structures, hydraulics, geotechnics, environmental engineering, highway and transportation engineering, urban planning, or construction management. Yet, 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 economical 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, and the social sciences and humanities.

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 entities, 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. Presently, thirty-five percent of all civil engineers are in general management.

## MISSION

The mission of the civil engineering program at Trine University is to provide graduates with quality preparation for the practice of civil engineering, to provide graduates with opportunities to pursue graduate studies, and to provide technical and educational services to their profession and communities.

## 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 including achieving professional licensure and active participation in professional societies.
6. Graduates are engaged in business aspects of the profession, including marketing, budgeting, client or public interaction, and contracting.

## OUTCOMES

As specified by the accrediting body, engineering programs assure that their students will be able to:

- A. apply knowledge of mathematics, science, and engineering;
- B. design and conduct experiments, as well as to analyze and interpret data ;
- C. design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability;
- D. function on multidisciplinary teams;
- E. identify, formulate, and solve engineering problems ;
- F. demonstrate professional and ethical responsibility;
- G. communicate effectively;
- H. use the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context;
- I. recognize the need for, and an ability to engage in, life-long learning;
- J. discuss contemporary issues;
- K. use the techniques, skills, and modern engineering tools, necessary for engineering practice; and

## **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 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 organizations.

## **CIVIL & ENVIRONMENTAL ENGINEERING CURRICULUM**

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 documented and presented.

**BACHELOR OF SCIENCE IN CIVIL ENGINEERING**

**132 HRS.**

All civil engineering students must sit for the Fundamentals of Engineering (FE) examination as a requirement for graduation.

	Mathematics	Science	HUM/SS	Communication	Other
<b>General Education</b> 44 hours	MA 134 MA 164 MA 213	CH104 PH 224 PH 234	HUM elective (3) HUM elective (3) SS elective (3) SS elective (3)	ENG 103 ENG 133 SP 203	
<b>Additional Requirements</b> 13 hours	MA 233 MA 393	CH 114			ES 223
<b>Program Requirements</b> 75 hours	<p><b>General Engineering: 5 hours</b>                      GE 101 Introduction to Engineering                      GE 401 Professional Practice                      EGR 153 Engineering Graphics</p> <p><b>Engineering Science: 14 hours</b>                      ES 213 Statics                      ES 243 Solid Mechanics                      ES 323 Fluid Mechanics                      ES 382 Engineering Economics                      ES xx3 Engineering Science Elective</p> <p><b>Civil Engineering: 47 hours</b>                      CE 1021 Computer Tools for Civil Engineering                      CE 2001 Basic Surveying Laboratory                      CE 2003 Basic Surveying                      CE 3101 Environmental Engineering Aqueous Laboratory                      CE 3103 Environmental Engineering Aqueous                      CE 3201 Civil Engineering Materials Laboratory                      CE 3203 Civil Engineering Materials                      CE 3301 Hydraulics Laboratory                      CE 3303 Hydraulics                      CE 3501 Structural Analysis Laboratory                      CE 3503 Structural Analysis                      CE 3521 Structural Design Laboratory                      CE 3523 Introduction to Structural Design                      CE 3603 Transportation Engineering                      CE 3701 Soil Mechanics Laboratory                      CE 3703 Soil Mechanics                      CE xxx3 Civil Engineering In-Depth Elective                      CE xxx3 Civil Engineering In-Depth Elective                      CE xxx3 Civil Engineering In-Depth Elective                      CE 4912 Civil Engineering Design Seminar                      CE 4914 Civil Engineering Design</p> <p><b>Other Electives: 9 hours</b>                      XX XX3 Business Elective                      XX XX3 Professional Development Elective                      XX XX3 Professional Development Elective</p>				

**TOTAL IN DEGREE PROGRAM:**

**132 HRS.**

## **DEPARTMENT OF ELECTRICAL & COMPUTER ENGINEERING**

The Department of Electrical and Computer Engineering offers the following degrees:

- **Bachelor of Science in Electrical Engineering**
- **Bachelor of Science in Computer Engineering**

Both the Electrical Engineering program and the Computer Engineering program are accredited by the Engineering Accreditation Commission of ABET, [www.abet.org](http://www.abet.org), 410.347.7700.

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 Electrical and Computer Engineering programs assure that graduates are prepared to:

1. devise, choose, and use diagrams or other models to design systems and to communicate engineering ideas.
2. recognize situations that demand new information, locate it, and use it in their work.
3. give oral and written reports for communication with peers and decision-makers.
4. coordinate with colleagues from their own and other disciplines.
5. recognize their ethical obligations and social responsibilities and maintain awareness of non-technical perspectives.

## OUTCOMES

As specified by the accrediting body, these engineering programs assure that students will be able to:

- A. apply knowledge of mathematics, science, and engineering;
- B. design and conduct experiments, as well as to analyze and interpret data ;
- C. design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability;
- D. function on multidisciplinary teams;
- E. identify, formulate, and solve engineering problems ;
- F. demonstrate professional and ethical responsibility;
- G. communicate effectively;
- H. use the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context;
- I. recognize the need for, and an ability to engage in, life-long learning;
- J. discuss contemporary issues;
- K. use the techniques, skills, and modern engineering tools, necessary for engineering practice; and

## 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.

## **BACHELOR OF SCIENCE IN COMPUTER ENGINEERING**

The Computer Engineering degree program requires 132 semester hours of study comprising 44 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 10 hours of general engineering courses, 31 hours of required electrical and computer engineering core courses, 11 hours of computer engineering required courses, 12 hours of ECE-, CS-, or CO-prefixed elective courses, and 15 hours of open electives. Students are encouraged to use the 15 open elective hours to meet the requirements for a minor in an area of their interest.

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.

**BACHELOR OF SCIENCE IN COMPUTER ENGINEERING**

**132 HOURS**

	Mathematics	Science	Hum/SS	Communication	Other
<b>General Education 44 hours</b>	MA 134 MA 164 MA 213	CH 104 PH 224 PH 234	HUM elective (3) HUM elective (3) SS elective (3) SS elective (3)	ENG 103 ENG 133 SP 203	
<b>Additional Requirements 9 hours</b>	MA 233 MA 393 MA 473				
<b>Program Requirements 79 hours</b>	<p><b><u>Computer Programming: 3 hours</u></b> CS 1113 Object-Oriented Java Programming</p> <p><b><u>Engineering Science: 5 hours</u></b> ES elective ES elective</p> <p><b><u>General Engineering: 2 hours</u></b> GE 101 Introduction to Engineering GE 401 Professional Practice</p> <p><b><u>Electrical &amp; Computer Engineering Core: 31 hours</u></b> ECE 103 Prototyping &amp; Projects ECE 211 Circuits Laboratory ECE 213 Circuit Analysis ECE 231 Discrete Electronics Laboratory ECE 233 Discrete Electronics ECE 243 Analog Signals ECE 261 Digital Systems Laboratory ECE 263 Digital Systems ECE 271 Microcontrollers Laboratory ECE 273 Microcontrollers ECE 453 Random Processes in ECE ECE 4001 Contemporary Issues ECE 4002 Project Management ECE 4003 Design Project</p> <p><b><u>Computer Engineering Concentration: 11 hours</u></b> CS 1123 C++ &amp; Object-Oriented Design ECE 361 Logic &amp; Computer Design Laboratory ECE 363 Logic &amp; Computer Design ECE 371 Embedded Systems Laboratory ECE 373 Embedded Systems</p> <p><b><u>Computer Engineering Concentration Electives: 12 hours</u></b> Chosen from CS, ECE, or CO prefixed courses</p> <p><b><u>Open Electives – 15 hours</u></b> Chosen from approved courses to bring total hours to 132</p>				

**TOTAL IN DEGREE PROGRAM:**

**132 HRS.**

## **BACHELOR OF SCIENCE IN ELECTRICAL ENGINEERING**

The Electrical Engineering degree program requires 132 semester hours of study comprising 44 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 10 hours of general engineering courses, 31 hours of required electrical and computer engineering core courses, 11 hours of electrical engineering required courses, 12 hours of ECE-, CS-, or CO-prefixed elective courses, and 15 hours of open electives. Students are encouraged to use the 15 open elective hours to meet the requirements for a minor in an area of their interest.

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.

**BACHELOR OF SCIENCE IN ELECTRICAL ENGINEERING 132 HOURS**

	Mathematics	Science	Hum/SS	Communication	Other
General Education 44 hours	MA 134 MA 164 MA 213	CH 104 PH 224 PH 234	<u>12 hours</u> HUM elective HUM elective SS elective SS elective	ENG 103 ENG 133 SP 203	
Add'l 9 hours	MA 233 MA 393  MA elective (3)				
Program Requirements 79 hours	<p><b><u>Computer Programming: 3 hours</u></b> CS 1113 Object-Oriented Java Programming</p> <p><b><u>Engineering Science: 5 hours</u></b> ES elective ES elective</p> <p><b><u>General Engineering: 2 hours</u></b> GE 101 Introduction to Engineering GE 401 Professional Practice</p> <p><b><u>Electrical &amp; Computer Engineering Core: 31 hours</u></b> ECE 103 Prototyping &amp; Projects ECE 211 Circuits Laboratory ECE 213 Circuit Analysis ECE 231 Discrete Electronics Laboratory ECE 233 Discrete Electronics ECE 243 Analog Signals ECE 261 Digital Systems Laboratory ECE 263 Digital Systems ECE 271 Microcontrollers Laboratory ECE 273 Microcontrollers ECE 453 Random Processes in ECE ECE 4001 Contemporary Issues ECE 4002 Project Management ECE 4003 Design Project</p> <p><b><u>Electrical Engineering Concentration: 11 hours</u></b> ECE 301 Electrical Machines Laboratory ECE 303 Electrical Machines ECE 323 Dynamic EM Fields ECE 481 Instrument Systems Laboratory ECE 483 Instrument Systems</p> <p><b><u>Electrical Engineering Concentration Electives:-12 hours</u></b> Chosen from CS, ECE, or CO prefixed courses</p> <p><b><u>Open Electives: 15 hours</u></b> Chosen from approved courses to bring total hours to 132</p>				

**TOTAL IN DEGREE PROGRAM:**

**132 HRS.**

## **WADE DEPARTMENT OF MECHANICAL, AEROSPACE, AND BIOMEDICAL ENGINEERING**

The Dr. Forrest V. Wade Department of Mechanical, Aerospace, and Biomedical Engineering was named in honor of Dr. Forrest V. Wade, a 1930 mechanical engineering graduate. The department offers the following undergraduate degree:

- **Bachelor of Science in Biomedical Engineering**
- **Bachelor of Science in Mechanical Engineering**

Trine University's Mechanical Engineering program is accredited by the Engineering Accreditation Commission of ABET, [www.abet.org](http://www.abet.org), 410.347.7700.

### **BACHELOR OF SCIENCE IN BIOMEDICAL ENGINEERING**

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 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 vision of the Allen School of Engineering.

### **MISSION**

The mission of the biomedical engineering program at Trine University is to enable students to become productive biomedical engineers, to advance to leadership roles in the profession, and to provide service to society.

### **OBJECTIVES**

To satisfy the mission, the department has established the following educational objectives:

1. to provide graduates with high quality preparation for the practice of biomedical engineering and related disciplines at the professional level;
2. to offer graduates opportunities to pursue graduate studies, lifelong learning, and to offer services to their professions; and
3. to provide graduates able to supply technical expertise and engineering education services to industry and the community.

### **OUTCOMES**

As specified for accreditation, the Biomedical Engineering Program assures the students will be able to:

- A. apply knowledge of mathematics, science, and engineering;
- B. design and conduct experiments, as well as to analyze and interpret data;
- C. design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability;
- D. function on multidisciplinary teams;

## Trine University

- E. identify, formulate, and solve engineering problems;
- F. identify professional and ethical responsibility;
- G. communicate effectively;
- H. apply the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context;
- I. recognize the need for, and an ability to engage in, life-long learning;
- J. identify contemporary issues; and
- K. use the techniques, skills, and modern engineering tools, necessary for engineering practice.

### **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.

**BACHELOR OF SCIENCE IN MECHANICAL ENGINEERING 132 HRS.**

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 machines of all types, from paper clips to space shuttles. They plan, design, and direct the manufacture, distribution, and operation of these machines. 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 fulltime 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.

## **OBJECTIVES**

To satisfy the mission the department has established the following educational objectives:

- To provide graduates with high quality preparation for the practice of mechanical engineering and related disciplines at the professional level;
- To offer graduates opportunities to pursue graduate studies, lifelong learning, and to offer services to their professions; and
- To supply technical expertise and engineering and education services to industry and the community.

## **OUTCOMES**

As specified by ABET, accrediting body for engineering curricula, the Mechanical Engineering program assures that graduates will be able to:

- A. apply knowledge of mathematics, science, and engineering;
- B. design and conduct experiments, as well as to analyze and interpret data;
- C. design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability;
- D. function on multidisciplinary teams;
- E. identify, formulate, and solve engineering problems;
- F. exhibit professional and ethical responsibility;
- G. communicate effectively;
- H. use the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context;
- I. identify the need for, and an ability to engage in, life-long learning;
- J. recognize contemporary issues and their importance; and
- K. the techniques, skills, and modern engineering tools, necessary for engineering practice.

## **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.

## **THE MECHANICAL ENGINEERING CURRICULUM**

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.

**BACHELOR OF SCIENCE IN MECHANICAL ENGINEERING 132 HRS.**

	Mathematics	Science	Hum/SS	Communication	Other
General Education 44 hours	MA 134 MA 164 MA 213	CH 104 PH 224 PH 234	HUM elective (3) HUM elective (3) ECO 213 SS elective (3)	ENG 103 ENG 133 SP 203	
Additional Requirements 12 hours	MA 233 MA 313 MA 393			EGR 143	
Core Requirements 76 hours	<p><b><u>General Engineering: 2 hours</u></b>                      GE 101 Introduction to Engineering                      GE 401 Professional Practice</p> <p><b><u>Unrestricted Electives: 6 hours</u></b>                      Electives (6)</p> <p><b><u>Engineering Science: 23 hours</u></b>                      ES 213 Statics                      ES 223 Dynamics                      ES 233 Engineering Materials                      ES 243 Solid Mechanics                      ES 253 Electrical Science                      ES 313 Thermodynamics                      ES 343 Heat Transfer                      ES 382 Engineering Economics</p> <p><b><u>ME CORE 36 hours</u></b>                      MAE 203 Mechanical Engineering Analysis                      MAE 243 Manufacturing Processes and Equipment                      MAE 303 Mechanics of Machinery                      MAE 323 Thermodynamics II                      MAE 3033 Fluid Dynamics for Mechanical Engineering                      MAE 353 Machine Component Design                      MAE 373 Computer Aided Machine Design                      MAE 413 Thermal Fluid Component Design</p> <p>MAE 453 Mechanical Vibrations  <b>or</b>                      MAE 4023 System Dynamics and Controls</p> <p>MAE 463 Measurement Lab                      MAE 4053 Mechanical Design I                      MAE 4063 Mechanical Design II</p> <p><b><u>Mechanical Electives 9 hours</u></b>                      Electives must be MAE courses of 300-level or higher, unless completing an engineering minor.                      MAE XX3                      MAE XX3                      MAE XX3</p>				

**TOTAL IN DEGREE PROGRAM:**

**132 HRS.**

## **DEPARTMENT OF TECHNOLOGY**

The Department of Technology offers the following degree:

### **• Bachelor of Science in Design Engineering Technology**

Students are prepared for the innovative design work required in this area by providing them undergraduate preparation that includes a foundation in mathematics and science, proper development in communication skills, an understanding of the relevance and impact of engineering and technology on society through a combination of classroom study and “hands on” laboratory experiences.

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 Technology, 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.

### **OUTCOMES**

Our program assures that students attain the following outcomes:

- A. An ability to apply knowledge of mathematics, science, and engineering
- B. An ability to design and conduct experiments, as well as to analyze and interpret data
- C. An ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability
- D. An ability to function on multidisciplinary teams

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- E. An ability to identify, formulate, and solve engineering problems
- F. An understanding of professional and ethical responsibility
- G. An ability to communicate effectively
- H. The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context.
- I. A recognition of the need for, and an ability to engage in, life-long learning
- J. A knowledge of contemporary issues
- K. An ability to use the techniques, skills, and modern engineering tools, necessary for engineering practice.

### **DESIGN ENGINEERING TECHNOLOGY CURRICULUM**

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 an advisory board of engineers from various industries.

**BACHELOR OF SCIENCE IN DESIGN ENGINEERING TECHNOLOGY 121 HRS.**

	Mathematics	Science	Hum/SS	Communication	Other
General Education 42 hours	MA 113 MA 123 MA 134 MA 253	PH 154 PH 164	PSY 113 ECO 213 ECO 223 HUM elective (3)	ENG 103 ENG 133 SP 203	
Add'l hrs		CH 144	ECO 233		
Core Requirements 72 hours	<p><b><u>Design Engineering Technology : 46 hours</u></b>                      ETD 101 Introduction to Engineering Technology                      ETD 103 Basic Technical Drawing                      ETD 113 Geometric Dimensioning &amp; Tolerancing                      ETD 123 Manufacturing Materials &amp; Processes                      ETD 163 Environmental Health &amp; Safety                      ETD 173 Computer-Aided 3D Modeling                      ETD 203 Basic Mechanisms                      ETD 233 Engineering &amp; Manufacturing Systems                      ETD 263 Design, Analysis, &amp; Prototyping                      ETD 273 Electrical Fundamentals                      ETD 313 Design for Manufacture and Assembly                      ETD 333 Statics &amp; Strength of Materials                      ETD 363 Elements of Machines                      ETD 433 Computer Numerical Control                      ETD 463 Senior Design Project I                      ETD 473 Senior Design Project II</p> <p><b><u>Additional Requirements: 18 hours</u></b>                      COM 213 Business Communication                      EGR 453 Advanced Parametric Design                      INF 103 Information Applications                      MGT 353 Designing Operations                      MGT 363 Organizational Behavior                      MGT 413 Management of Quality</p> <p><b><u>Free Electives: 8 hours</u></b>                      Department Approved Elective (2 hrs min)                      300/400 Department Approved Elective                      300/400 Department Approved Elective</p>				

**TOTAL IN DEGREE PROGRAM:**

**121 HRS.**

## FRANKS SCHOOL OF EDUCATION

Trine University's Franks School of Education includes this department:

- SHEVENAUGH DEPARTMENT OF ELEMENTARY EDUCATION

Academic programs administered by the school are as follows:

BACHELOR OF SCIENCE WITH MAJORS IN:

- ELEMENTARY EDUCATION
- HEALTH/PHYSICAL EDUCATION
- MATHEMATICS EDUCATION
- SCIENCE EDUCATION
- SOCIAL STUDIES EDUCATION

*Information presented here is subject to change at any time, depending on actions taken by the Indiana Department of Education/Office of Educator Licensing and Development. 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 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.

All education programs are built upon three major components that are deemed necessary for effective and productive teachers—content, communication, and caring. Each is dependent upon the other, and together they describe the knowledge, dispositions, and performances of a knowledgeable, reflective educator.

### ACCREDITATION

The Trine University Franks School of Education is accredited by the Indiana Department of Education/Office of Educator Licensing and Development (DOE/OELD) and by the Council for Accreditation of Educator Preparation (CAEP).

## **MISSION OF THE SCHOOL**

The mission of the Franks School of Education at Trine University is to provide an educational atmosphere in which each teacher candidate is challenged to become the best educator he or she can be. Faculty members of the School are committed to helping each future educator achieve his or her potential as a knowledgeable, reflective educator who is committed to and able to provide for the growth of all learners.

## **PROFESSIONAL COMMITMENTS AND DISPOSITIONS**

The Franks School of Education at Trine University adopted the ten principles developed by the Interstate Teacher Assessment and Support Consortium (InTASC) as program objectives, and two additional objectives specific to the mission of the School.

1. The teacher candidate understands the central concepts, tools of inquiry, and structures of the discipline(s) he or she teaches, and can create learning experiences that make these aspects of subject matter meaningful for students.
2. The teacher candidate understands how children learn and develop, and can provide learning opportunities that support their intellectual, social, and personal development.
3. The teacher candidate understands how students differ in their approaches to learning and creates instructional opportunities that are adapted to diverse learners.
4. The teacher candidate understands and uses a variety of instructional strategies to encourage students' development of critical thinking, problem solving, and performance skills.
5. The teacher candidate uses an understanding of individual and group motivation and behavior to create a learning environment that encourages positive social interaction, active engagement in learning, and self-motivation.
6. The teacher candidate uses knowledge of effective verbal, nonverbal, and media communication techniques to foster active inquiry, collaboration, and supportive interaction in the classroom.
7. The teacher candidate plans instruction based upon knowledge of subject matter, students, the community, and curriculum goals.
8. The teacher candidate understands and uses formal and informal assessment strategies to evaluate and ensure the continuous intellectual, social, and physical development of the learner.
9. The teacher candidate is a reflective practitioner who continually evaluates the effects of his/her choices and actions on others (students, parents, and other professionals in the learning community) and who actively seeks out opportunities to grow professionally.
10. The teacher candidate fosters relationships with school, colleagues, parents, and agencies in the larger community to support students' learning and well-being.
11. The teacher candidate organizes and implements instruction for students based on an understanding of the caring ethic.

## Trine University

12. The teacher candidate understands and applies interpersonal communication skills that support the caring ethic.

### **ADMISSION TO TEACHER EDUCATION**

Two courses, EDU 111 Freshman Practicum and EDU 211 Sophomore Practicum, may be taken prior to official admission to teacher education. Other courses with EDU prefixes may be taken only after the candidate has applied to and has been accepted into teacher education. A candidate may apply for admission to teacher education (which allows her/him to pursue a teacher education degree in a selected major) after completing the following:

1. earned State of Indiana passing scores on reading, writing, and mathematics sections of the Core Academic Skills Assessment (CASA);
2. completed 12 semester hours of university credit with a cumulative GPA of 2.5 or higher;
3. submitted three positive letters of recommendation supporting the candidate's admission to teacher education;
4. submitted an expanded criminal background check; and
5. submitted appropriate application forms.

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 Licensing and Development and the National Council for Accreditation of Teacher Education.

**Approved programs include the following:**

- Elementary Education (K-6)*
- Health/Physical Education (P-12)*
- Mathematics Education (5 -12)*
- Science Education (5 -12)*
- Social Studies Education (5 -12)*

Science education majors must choose at least one content area from life science/biology or chemistry.

Social studies education majors must choose at least three content areas from economics, geographical perspectives, government and citizenship, historical perspectives, and/or psychology.

Applicable standards for each program are InTASC general standards, IDOE/OELD developmental standards, and IDOE/OELD content standards.

### **REMAINING IN TEACHER EDUCATION**

Once officially admitted, retention in teacher education is contingent upon good academic standing and successful passing of Benchmark requirements. The GPA required for admission is 2.5 overall. Upon admission, if the candidate's GPA falls below 2.5, the candidate

## Trine University

will be placed on probation. Education courses may be taken the next semester only with permission of the Teacher Education Committee. If the GPA remains below 2.5 at the completion of the probationary term, the candidate no longer is eligible to take EDU courses and may apply for readmission when a satisfactory GPA is achieved. The candidate must also successfully meet requirements at various checkpoints (Benchmark #1, #2, #3, #4).

### **TESTING REQUIREMENTS**

To be eligible for admission to teacher education, state of Indiana passing scores on CASA basic skills exam must be submitted. To be eligible for student teaching, 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 dean of the Franks School of Education. The student teacher participates in a classroom with a cooperating teacher for 10-11 full weeks. The GPA requirement for enrollment in student teaching is 2.5 overall, as well as 2.5 in all intended areas of licensure. To be eligible for licensure, the teacher candidate must have earned an overall GPA of 2.5 or higher, a GPA of 2.5 or higher in all areas of licensure, must have successfully completed student teaching with a GPA of 2.5 or higher, and must have met all Benchmark requirements at established levels.

### **LICENSING ADVISOR**

Trine University's licensing advisor is the dean of the Franks School of Education.

**BACHELOR OF SCIENCE ELEMENTARY EDUCATION (K-6) 121 HRS.**

To be eligible for licensure as an elementary teacher in grades K-6, the following program of study must be completed.

	Mathematics	Science	Hum/SS	Communication	Other
General Education 43 hours	MA 184 MA 194	BIO 104	ENG 153 ART 253 PSY 113 HIS 103	ENG 103 ENG 113  SP 203 <i>or</i> COM 163	EXS 102 GOV 113 HIS 113 HPE 232
Additional Requirements 25 hours		PH 104 AST 203/201	MUS 272  ECO 213 <i>or</i> ECO 223  SOC 323 GEO 303 GEO 323		HPE 342 UE 101
Content Requirements 53 hours	EDU 111 Freshman Practicum EDU 211 Sophomore Practicum EDU 212 Introduction to Music Fundamentals EDU 222 Educational Psychology – Elementary EDU 301 Introduction to Teaching Practicum EDU 303 Introduction to Teaching EDU 311 Junior Practicum EDU 312 Exceptional Children in Schools EDU 342 The Kindergarten Experience EDU 353 Children’s Literature EDU 441 Teaching of Reading Practicum EDU 445 Teaching of Reading EDU 452 Art for the Elementary Teacher EDU 454 Methods of Math/Science EDU 462 Educational Assessment EDU 463 Educational Media and Technology EDU 464 Methods of Language Arts/Social Studies EDU 470 Student Teaching EDU 471 Student Teaching Seminar EDU 473 Issues in American Public Education				

**TOTAL IN DEGREE PROGRAM:**

**121 HRS.**

**BACHELOR OF SCIENCE HEALTH/PHYSICAL EDUCATION (P-12) 132 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.

	Mathematics	Science	Hum/SS	Communication	Other
General Education 42 hours	MA 113 <i>or</i> MA 153	BIO 104 BIO 254	ENG 153 Hum elective (3) PSY 113 SS elective (3)	ENG 103 ENG 113 SP 203 <i>or</i> COM 163	EXS 102  Gen Ed elec (8)
Add'l 1 hour					UE 101
Health and Physical Education Courses 42 hours	<p><b>Content Requirements</b></p> <p>EXS 103 Teaching Sport and Recreation Activities I                      EXS 123 Teaching Sport and Recreation Activities II                      EXS 131 First Aid (waived if valid CPR)                      EXS 212 Adaptive Physical Education                      EXS 243 Athletic Training                      EXS 273 Nutrition                      EXS 332 Drug Education                      EXS 333 Kinesiology                      EXS 373 Health Problems                      EXS 433 Developing Health Promotion Programs                      EXS 463 Motor Learning                      HPE 342 School and Community Health                      HPE 352 Family Life Education                      SM 223 History of PE and Sport                      SM 253 Risk Management                      SM 413 Organization and Administration of PE and Athletics</p>				
Professional Education Courses 47 hours	<p><b>Professional Education Requirements</b></p> <p>EDU 111 Freshman Practicum                      EDU 211 Sophomore Practicum                      EDU 212 Introduction to Music Fundamentals                      EDU 222 Educational Psychology – Elementary                      HPE 232 PE for the Elementary Teacher                      EDU 232 Educational Psychology – Middle/Secondary                      EDU 301 Introduction to Teaching Practicum                      EDU 303 Introduction to Teaching                      EDU 311 Junior Practicum                      EDU 312 Exceptional Children in Schools                      EDU 333 Reading in the Content Area                      EDU 412 The Middle School                      EDU 422 Middle School Methods                      EDU 432 Practicum in Teaching – Secondary Teacher                      EDU 442 Special Methods – Secondary Teacher                      EDU 462 Educational Assessment                      EDU 463 Educational Media and Technology                      EDU 470 Student Teaching                      EDU 471 Student Teaching Seminar                      EDU 473 Issues in American Public Education</p>				

**TOTAL IN DEGREE PROGRAM:**

**132 HRS.**

**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.

	Mathematics	Science	Hum/SS	Communication	Other
General Education 42 hours	MA 134 MA 312	Lab science (4)	ENG 153 Hum elective (3) PSY 113 SS elective (3)	ENG 103 ENG 113  SP 203 <i>or</i> COM 163	EXS 102  INF 143 <i>or</i> CS 1113  Gen Ed Electives (6)
Add'l 1					UE 101
Mathematics Content Area Courses 34 hours	<u>Content Requirements</u> MA 164 Calculus II MA 213 Calculus III MA 233 Differential Equations MA 303 College Geometry MA 313 Linear Algebra MA 343 Sets and Logic MA 373 Abstract Algebra MA 393 Probability and Statistics MA 403 Advanced Calculus MA 473 Graphic Theory and Combinatorics MA XX3 300-400 level three credit Math course				
Professional Education Courses 43 hours	<u>Professional Education Requirements</u> EDU 111 Freshman Practicum EDU 211 Sophomore Practicum EDU 232 Educational Psychology – Middle/Secondary EDU 301 Introduction to Teaching Practicum EDU 303 Introduction to Teaching EDU 311 Junior Practicum EDU 312 Exceptional Children in Schools EDU 333 Reading in the Content Area EDU 432 Practicum in Teaching – Secondary Teacher EDU 442 Special Methods – Secondary Teacher EDU 462 Educational Assessment EDU 463 Educational Media and Technology EDU 412 The Middle School EDU 422 Middle School Methods EDU 472 Middle School Practicum EDU 470 Student Teaching EDU 471 Student Teaching Seminar EDU 473 Issues in American Public Education				

**TOTAL IN DEGREE PROGRAM:**

**120 HRS.**

**BACHELOR OF SCIENCE - EDUCATION/LIFE SCIENCES-(BIOLOGY) (5-12)**

To be eligible for licensure as a life sciences (biology) teacher in grades 5-12, the following program of study must be completed. **126 HRS.**

	Mathematics	Science	Hum/SS	Communication	Other
General Education 42 hours	MA 113  MA 123 <i>or</i> MA 134	CH 104  BIO 114	ENG 153  Hum elective (3) PSY 113  SS elective (3)	ENG 103  ENG 113  SP 203 <i>or</i> COM 163	EXS 102  CH 114  Gen Ed elec (1) - (1 additional credit of gen ed if math course is a three credit)
Add'l 1	UE 101 University Experience				
Content Requirements 40 hours	<p><b>Content Requirements</b></p> <p>BIO 124 Principles of Biology II                      BIO 254 Human Anatomy                      BIO 304 Plant Biology                      BIO 314 Animal Biology                      BIO 324 Microbiology                      BIO 334 Environmental Biology                      BIO 354 Human Physiology                      BIO 414 Genetics                      PH 154 College Physics                      SC 412 Senior Research Seminar                      SC 422 Senior Research Project</p>				
Professional Education Requirements 43 hours	<p><b>Professional Education Requirements</b></p> <p>EDU 111 Freshman Practicum                      EDU 211 Sophomore Practicum                      EDU 232 Educational Psychology – Middle/Secondary                      EDU 301 Introduction to Teaching Practicum                      EDU 303 Introduction to Teaching                      EDU 311 Junior Practicum                      EDU 312 Exceptional Children in Schools                      EDU 333 Reading in the Content Area                      EDU 432 Practicum in Teaching – Secondary Teacher                      EDU 442 Special Methods – Secondary Teacher                      EDU 462 Educational Assessment                      EDU 463 Educational Media and Technology                      EDU 412 The Middle School                      EDU 422 Middle School Methods                      EDU 472 Middle School Practicum                      EDU 470 Student Teaching                      EDU 471 Student Teaching Seminar                      EDU 473 Issues in American Public Education</p>				

**TOTAL IN DEGREE PROGRAM:**

**126 HRS.**

**BACHELOR OF SCIENCE-SCIENCE EDUCATION/CHEMISTRY (5-12) 130 HRS.**

To be eligible for licensure as a chemistry teacher in grades 5–12, the following program of study must be completed.

	Mathematics	Science	Hum/SS	Communication	Other
General Education 43 hours	MA 134 MA 164	CH 104 CH 114 PH 224	ENG 153 Hum elective (3) PSY 113 SS elective (3)	ENG 103 ENG 113  SP 203 <i>or</i> COM 163	EXS 102
Add'l courses 1 hour					UE 101
Chemistry Content Area Courses 43 hours	<b>Content Requirements</b> CH 203/211 Organic Chemistry I and Lab CH 213/221 Organic Chemistry II and Lab CH 234 Quantitative Analysis CH 244 Inorganic Chemistry CH 324 Instrumental analysis CH 353/351 Physical Chemistry I and Lab CH 363/361 Physical Chemistry II and Lab CH 434 Biochemistry MA 213 Calculus III PH 234 University Physics II SC 412 Senior Research Seminar SC 422 Senior Research Project				
Professional Education Courses 43 hours	<b>Professional Education Requirements</b> EDU 111 Freshman Practicum EDU 211 Sophomore Practicum EDU 232 Educational Psychology – Middle/Secondary EDU 301 Introduction to Teaching Practicum EDU 303 Introduction to Teaching EDU 311 Junior Practicum EDU 312 Exceptional Children in Schools EDU 333 Reading in the Content Area EDU 432 Practicum in Teaching – Secondary Teacher EDU 442 Special Methods – Secondary Teacher EDU 462 Educational Assessment EDU 463 Educational Media and Technology EDU 412 The Middle School EDU 422 Middle School Methods EDU 472 Middle School Practicum EDU 470 Student Teaching EDU 471 Student Teaching Seminar EDU 473 Issues in American Public Education				

**TOTAL IN DEGREE PROGRAM:**

**130 HRS.**

**BACHELOR OF SCIENCE SOCIAL STUDIES EDUCATION (5-12)131-134HRS.**

To be eligible for licensure as a social studies teacher in grades 5-12, the following program of study must be completed.

	Mathematics	Science	Hum/SS	Communication	Other
General Education 42 hours	MA 113 <i>or</i> MA 153	Lab Science elec (4)	ENG 153 Hum elective (3) PSY 113 HIS 103 GEO 213	ENG 103 ENG 113  SP 203 <i>or</i> COM 163	EXS 102 HIS 113 HIS 203 GOV 113
Add'l 1 hr					UE 101
Social Studies Content Area Courses 45-48 hours	<p><b>Content Requirements</b>                      HIS 213 World Civilization II                      ECO 223 Principles of Macroeconomics                      SOC 103 Principles of Sociology</p> <p><b>Three of the following concentrations:</b></p> <p><b>Economics</b>                      ECO 213 Principles of Microeconomics                      ECO 363 Comparative Economic Systems                      ECO 383 International Economics                      ECO 393 Economic History of the United States</p> <p><b>Geographical Perspectives</b>                      GEO 303 Human Geography                      GEO 313 Geography of north America                      GEO 323 World Geography                      GEO 353 Political Geography</p> <p><b>Government and Citizenship</b>                      GOV 313 Comparative Governments                      GOV 333 State and Local Government                      GOV 373 Political psychology                      GOV 403 American Constitutional Development</p> <p><b>Historical Perspectives</b>                      HIS 323 The Contemporary World                      HIS 343 American Political Thought                      HIS 363 United States Foreign policy                      HIS 423 The United States as a World Power                      HIS 453 Readings in World History</p> <p><b>Psychology</b>                      PSY 323 Abnormal Psychology                      PSY 333 Psychology of Personality                      PSY 343 Social Psychology                      PSY 353 Child and Adolescent Psychology</p>				

<b>Professional Education Courses</b> <b>43 hours</b>	<b><u>Professional Education Requirements</u></b> EDU 111 Freshman Practicum EDU 211 Sophomore Practicum EDU 232 Educational Psychology – Middle/Secondary EDU 301 Introduction to Teaching Practicum EDU 303 Introduction to Teaching EDU 311 Junior Practicum EDU 312 Exceptional Children in Schools EDU 333 Reading in the Content Area EDU 432 Practicum in Teaching – Secondary Teacher EDU 442 Special Methods – Secondary Teacher EDU 462 Educational Assessment EDU 463 Educational Media and Technology EDU 412 The Middle School EDU 422 Middle School Methods EDU 472 Middle School Practicum EDU 470 Student Teaching EDU 471 Student Teaching Seminar EDU 473 Issues in American Public Education
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**TOTAL IN DEGREE PROGRAM:**

**131-134 HRS.**

## **JANNEN SCHOOL OF ARTS & SCIENCES**

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

- DEPARTMENT OF CRIMINAL JUSTICE, PSYCHOLOGY AND SOCIAL SCIENCES
- DEPARTMENT OF HUMANITIES AND COMMUNICATION
- DEPARTMENT OF MATHEMATICS, INFORMATICS, & CYBERSECURITY
- DEPARTMENT OF MUSIC
- DEPARTMENT OF SCIENCE
- ENGLISH LANGUAGE CENTER
- LEARNING CENTER
- MATHEMATICS HELP SESSIONS
- WRITING CENTER

**Academic programs administered by the school are as follows:**

BACHELOR OF ARTS WITH MAJORS IN:

- COMMUNICATION
- GENERAL STUDIES
- PROFESSIONAL WRITING AND ENGLISH STUDIES

BACHELOR OF SCIENCE WITH MAJORS IN:

- BIOLOGY
- BIOLOGY PRE-PHYSICAL THERAPY (DPT 3+3)\*\*\*
- CHEMISTRY
- CRIMINAL JUSTICE
- FORENSIC SCIENCE
- INFORMATICS
- MATHEMATICS
- MUSIC WITH AN OUTSIDE MINOR
- PSYCHOLOGY
- CYBERSECURITY

ASSOCIATE IN ARTS

ASSOCIATE IN CRIMINAL JUSTICE

ASSOCIATE IN SCIENCE

MINORS IN: *SEE PAGE 76*

- BIOLOGY
- CHEMISTRY
- COMMUNICATION
- CRIMINAL JUSTICE
- HUMANITIES
- INTERNATIONAL STUDIES
- MATHEMATICS
- MUSIC
- PSYCHOLOGY

## **THE SCHOOL**

The Jannen School of Arts and Sciences was named in honor of Robert L. Jannen, a 1950 chemical engineering graduate and member of the University's Board of Trustees, and his wife Dolores.

While Trine University is recognized for its long-standing and highly regarded programs in engineering, business, and teacher education, the Jannen School of Arts and Sciences is becoming known for its career-oriented, challenging, and competitive programs in its five departments. These quality programs prepare graduates to be successful in their careers and to pursue graduate and professional studies.

The Jannen School of Arts and Sciences has a special relationship with the Franks School of Education through secondary education majors in mathematics, science, and social studies. Dedicated faculty in the Jannen School of Arts and Sciences teach the content areas as well as the general education component for secondary education majors.

Faculty members in the Jannen School of Arts and Sciences are committed to providing an excellent foundation for all Trine University students in the areas of written and oral communication; social, historical, and global studies; the humanities; the natural sciences; and the mathematical and computational sciences. Student learning in these disciplines provides the knowledge basis for the University's general education component that complements the professional program courses for all Trine University students.

## **THE MISSION**

In concert with the mission of Trine University, the Jannen School of Arts and Sciences provides students with the cultural, scientific, and academic platform from which to begin their journeys as lifelong learners and active contributors to the development of society.

**JANNON SCHOOL OF ARTS & SCIENCES ASSOCIATE DEGREES**

Jannen School of Arts & Sciences offers the following Associate degrees:

ASSOCIATE IN ARTS

ASSOCIATE IN CRIMINAL JUSTICE

ASSOCIATE IN SCIENCE

**ASSOCIATE IN ARTS**

**60 HRS.**

	Mathematics	Science	Hum/SS	Communication	Other
General Education 22 hours	Math elective (3)	Lab Science elective (4)	Hum. elective (3) SS elective (3)	ENG 103  ENG 113 Or ENG 133	Gen Ed Electives (3) <a href="#">General Education Requirements</a>
Additional Requirements 14 hours					UE 101 SP 203 Electives (10)
Content Requirements 24 hours	<u>Choose 24 hours in one of the following areas:</u> Communication (24) English (24) History (24) Humanities (24) Music (24)				

**TOTAL IN DEGREE PROGRAM:**

**60 HRS.**

**ASSOCIATE IN CRIMINAL JUSTICE**

**60 HRS.**

	Mathematics	Science	Hum/SS	Communication	Other
<b>General Education</b> 22 hours	Math Elective (3)	Lab Science Elective (4)	SS elective (3) HUM elec (3)	ENG 103  ENG 113 Or ENG 133	Gen Ed Elective (3)
<b>Additional Requirements</b> 14 hours					UE 101 Electives (13)
<b>Content Requirements</b> 24 hours	LE 103 Introduction to Criminal Justice LE 153 Juvenile Justice LE 253 Probation, Parole and Community Corrections LE 263 Introduction to Criminal Law and Justice LE 273 Criminal Procedures and Evidence LE 343 Criminalistics and Crime Scene Investigations I PSY 113 Principles of Psychology PSY 383 Forensic Psychology				

**TOTAL IN DEGREE PROGRAM:**

**60 HRS.**

**ASSOCIATE IN SCIENCE**

**60 HRS.**

	Mathematics	Science	Hum/SS	Communication	Other
General Education 22 hours	Math Elective (3)	Lab Science Elective (4)	SS Elective (3) HUM Elective (3)	ENG 103  ENG 113 Or ENG 133	Gen Ed Electives (3)
Additional Requirements 18 hours					UE 101 (1) Electives (17)
Content Requirements 20 hours	Mathematics or Science courses (20) <i>Student must complete an area of emphasis which includes 20 total hours in either a science discipline or mathematics.</i>				

**TOTAL IN DEGREE PROGRAM:**

**60 HRS.**

## **DEPARTMENT OF CRIMINAL JUSTICE, PSYCHOLOGY, & SOCIAL SCIENCES**

The Department of Criminal Justice, Psychology, & Social Sciences' 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. The Department of Criminal Justice, Psychology and Social Sciences provides an educational environment in which students receive individual attention as well as excellence in teaching. The Department offers programs leading to careers in criminal justice, mental health, and social sciences education, as well as a preparation for further professional training in law, public administration, psychology, history, and social service. The Department aims to prepare graduates to be productive early in their professional careers and to assume leadership roles in the public and private sector, while providing service to society.

**The Department of Criminal Justice, Psychology, & Social Sciences offers the following degrees:**

BACHELOR OF SCIENCE WITH MAJORS IN:

- CRIMINAL JUSTICE
- PSYCHOLOGY

BACHELOR OF ARTS WITH A MAJOR IN:

- GENERAL STUDIES

**BACHELOR OF SCIENCE – CRIMINAL JUSTICE MAJOR**

**120 HRS.**

	Mathematics	Science	Hum/SS	Communication	Other
General Education 42 hours	MA 113 <i>or</i> MA 153	BIO 104 (lab)  MA or SC Elec (3)	ENG 153 Hum elective (3)  HIS 103 <i>or</i> HIS 203  HIS 113 <i>or</i> HIS 213	ENG 103 ENG 113  SP 203 <i>or</i> COM 163	SOC 103 <i>or</i> PSY 113  GOV 113 EXS 102 INF 103
Content Requirements 63 hours	UE 101 University Experience GOV 333 State and Local Government GOV 403 American Constitutional Development LE 103 Introduction to Criminal Justice LE 153 Juvenile Justice LE 253 Probation, Parole, and Community Corrections LE 263 Introduction to Criminal Law and Justice LE 273 Criminal Procedures and Evidence LE 343 Criminalistics and Crime Scene Investigations I LE 473 Law Enforcement Internship PSY 383 Forensic Psychology <b>Electives (32)</b> - Electives are determined in conjunction with an advisor and based on student career objectives.				
Concentrations 15 hours	<b>Select one of the following five concentrations. (15 Hours)</b> <u><b>Option A – Law Enforcement</b></u> LE 313 Police Administration LE 353 Criminalistics and Crime Scene Investigations II LE 423 Criminal Justice Agency Administration PSY 443 Advanced Forensic Psychology SOC 323 The Family <u><b>Option B – Forensic/Correctional Psychology</b></u> LE 363 Institutional Corrections and Correctional Law PSY 323 Abnormal Psychology PSY 413 The Psychology of Addiction PSY 423 Counseling Theories and Practices PSY 443 Advanced Forensic Psychology <u><b>Option C – Agency Administration</b></u> LE 313 Police Administration LE 363 Institutional Corrections and Correctional Law LE 423 Criminal Justice Agency Administration MGT 313 Human Resources Management MGT 363 Organizational Behavior <u><b>Option D – Psychology</b></u> PSY 323 Abnormal Psychology PSY 333 Psychology of Personality PSY 343 Social Psychology PSY 353 Child and Adolescent Psychology PSY 423 Counseling Theories and Practices <u><b>Option E – Indiana Law Enforcement</b></u> LE 4015 Successful completion of Indiana Law Enforcement Academy Basic Police Training Course				

**TOTAL IN DEGREE PROGRAM:**

**120 HRS.**

**BACHELOR OF SCIENCE – PSYCHOLOGY MAJOR**

**120 HRS.**

	Mathematics	Science	Hum/SS	Communication	Other												
<b>General Education</b> 42hours	MA 113 <i>or</i> MA 153	BIO 104 (lab)  MA or SC Elec (3)	Hum elective (3) Hum elective (3)  GOV 113  ECO 213 <i>or</i> ECO 223	ENG 103 ENG 113  SP 203 <i>or</i> COM 163	EXS 102 INF 103  HIS 103 <i>or</i> HIS 203  HIS 113 <i>or</i> HIS 213												
<b>Program Requirements</b> 36 hours	<p><b>Electives: 35 hours</b> Students wishing to pursue graduate training in psychology should take: MA 113 College Algebra and MA 253 Statistics within these electives.</p>																
<b>Content Requirements</b> 42 hrs.	<p><b>Primary Core</b> Choose 18 hours from any 300 level or higher psychology courses or SOC 313, SOC 323, SOC 343, excluding subject area concentration courses chosen below. (6 X 3 credits)</p> <p><b>Required:</b></p> <table style="width: 100%; border: none;"> <tr> <td style="width: 80%;">PSY 113 Principles of Psychology</td> <td style="width: 20%;">1 _____</td> </tr> <tr> <td>PSY 303 Research Methods in Psychology</td> <td>2 _____</td> </tr> <tr> <td>PSY 453 Clinical Internship</td> <td>3 _____</td> </tr> <tr> <td>Or</td> <td>4 _____</td> </tr> <tr> <td>473 Psychology Capstone Demonstration</td> <td>5 _____</td> </tr> <tr> <td></td> <td>6 _____</td> </tr> </table> <p><b>Choose two of the following clinical courses:</b>                      PSY 323 Abnormal Psychology                      PSY 403 Human Sexuality                      PSY 413 The Psychology of Addiction                      PSY 423 Counseling Theories and Practices</p> <p><b>Choose two of the following social core courses:</b>                      PSY 333 Psychology of Personality                      PSY 343 Social Psychology                      PSY 373 Political Psychology                      SOC 313 Topics in Sociology</p> <p><b>Choose one of the following developmental core courses:</b>                      PSY 353 Child and Adolescent Psychology                      SOC 323 The Family</p>					PSY 113 Principles of Psychology	1 _____	PSY 303 Research Methods in Psychology	2 _____	PSY 453 Clinical Internship	3 _____	Or	4 _____	473 Psychology Capstone Demonstration	5 _____		6 _____
PSY 113 Principles of Psychology	1 _____																
PSY 303 Research Methods in Psychology	2 _____																
PSY 453 Clinical Internship	3 _____																
Or	4 _____																
473 Psychology Capstone Demonstration	5 _____																
	6 _____																
<b>TOTAL IN DEGREE PROGRAM:</b>																	

**120 HRS.**

**BACHELOR OF ARTS - GENERAL STUDIES MAJOR**

**120 HRS.**

	Mathematics	Science	Hum/SS	Communication	Other
General Education 42 hours	MA 113	SC elective (4)  SC Elective (3)	ENG 153 Hum elective (3) HIS 103 HIS 113	ENG 103 ENG 113  SP 203	PSY 113  GOV 113 EXS 102 INF 103
1 hr.					UE 101
Content Requirements 48 hours	<p><b>Select one of the options below:</b></p> <p><b><u>Option A – Pre-Legal Studies Concentration (48)</u></b>                      COM 213 Business Communication                      COM 363 Persuasion and Argumentation                      ENG 2113 American Literature I                      GOV 333 State and Local Government                      GOV 403 American Constitutional Development</p> <p>LE 153 Juvenile Justice, LE 263 Introduction to Criminal Law and Justice, LE 273 Criminal Procedures and Evidence <i>or</i>                      9 hours from BA or LAW</p> <p>PHL 313 Ethics                      PHL 343 Logic                      PSY 373 Political Psychology                      SOC 103 Principles of Sociology                      SOC 323 The Family                      Electives (6) – from LE, ENG, PSY, or COM                      PL 4003 Legal Capstone Experience</p> <p><b><u>Option B – General Social Studies Concentration (48)</u></b>                      15 hours from each of three of the following at the 300 or higher level:                      GOV, HIS, PSY, ECO, GEO                      GS 4003 Senior Capstone Project</p> <p><b><u>Option C – Self-Designed Studies Concentration (48)</u></b>                      15 to 30 hours must be taken from two to three different academic departments at the 300 level or higher.                      GS 4003 Senior Capstone Project</p>				
Electives 29 hours	Electives 29				

**TOTAL IN DEGREE PROGRAM:**

**120 HRS.**

## **PRE-LAW**

Admission to an accredited school of law normally requires a bachelor's degree. The Association of American Law Schools does not recommend a specific major, but students will be expected to have a broad academic background, a good scholastic record, and acceptable scores on the law school admission test. Usually that type of preparation is more beneficial for a prospective law student than is the specialized study of subjects closely related to law.

Any degree program that stresses the ability to communicate both verbally and in writing, encourages an understanding of human values, promotes understanding, reasoning and critical thinking, and fosters creativity is an excellent program for a student planning to pursue a law degree after graduation.

The Department of Criminal Justice, Psychology and Social Sciences offers a General Studies major with a Concentration in Pre-Legal Studies which is designed to prepare students for law school and is recommended for students intending to go to law school who do not have a strong interest in another undergraduate discipline. The department stresses that pre-law students should seek frequent, regular advice from their advisors and from the pre-law advisor located in this department.

## **DEPARTMENT OF HUMANITIES & COMMUNICATION**

**The Department of Humanities & Communication offers the following degree:**

BACHELOR OF ARTS WITH MAJORS IN:

- COMMUNICATION
- PROFESSIONAL WRITING AND ENGLISH STUDIES

The Department of Humanities and Communication faculty has identified its mission as providing students a well-rounded preparation for a successful career in a variety of professions, including public relations, management, corporate communication, journalism and broadcasting.

The faculty fosters individual attention designed to support students with a multidisciplinary approach to problem solving and critical thinking required to translate what is learned into effective action. Three Communication options or tracks are available (Public Relations/Journalism, Corporate Communication and General Communication) with each designed for students to acquire leadership skills necessary to attain career goals and excel in various forms of electronic and print media.

We believe a student's education is the responsibility of all members of the campus community and accomplished in a variety of ways including Communication Department assignments with campus radio station, newspaper, yearbook, Trine University's marketing department and a variety of internships with professional organizations throughout the region.

**BACHELOR OF ARTS—COMMUNICATION MAJOR**

**120 HRS.**

	Mathematics	Science	Hum/SS	Communication	Other
General Education 42 hours	Must take 1 Math (3-4 cr. hrs.) and 1 Science course (3-4 cr. hrs.) plus a Math or Science elective to total 10 credit hours		COM 233 Literature course (3) PSY 113 SS elective (3)	ENG 103 ENG 113  SP 203	COM 123 COM 163 COM 203  General Ed elect (2)
Advised					UE 101 Free electives (29)
Content Requirements 27 hours	<p><b>Communication Core</b></p> <p>COM 111 Communication Practices and Professions COM 153 Principles of Public Relations COM 213 Business Communication COM 253 Event Planning and Promotion COM 263 Theories and Research in Communication COM 293 Argumentation and Debate COM 301 Media Practicum (<b>taken twice</b>) (2) COM 363 Rhetoric and Persuasion COM 433 Media Law and Ethics</p> <p>COM 4013 Senior Capstone Internship <i>or</i> COM 4281 Senior Communication Proposal <i>and</i> COM 4292 Senior Communication Project</p>				
Tracks 21 hours	<p><b>Choose One Track Listed Below:</b></p> <p><b>Public Relations and Corporate Communication Track</b> COM 353 Public Relations Writing and Production COM 413 Corporate and Organizational Communication COM 453 Public Relations Planning and Campaigns MK 323 Integrated Marketing Communications MK 463 Marketing Research Communication electives (selected in consultation with advisor) (6)</p> <p><b>New Media Production Track</b> COM 183 Writing for Media COM 243 Digital Media Creation COM 343 Web Content Management COM 383 Feature Reporting COM 483 Public Affairs Reporting FLM 203 Film Appreciation Communication electives (selected in consultation with advisor) (3)</p>				

**TOTAL IN DEGREE PROGRAM:**

**120 HRS.**

**BACHELOR OF ARTS—  
PROFESSIONAL WRITING AND ENGLISH STUDIES MAJOR 120 HRS.**

	Mathematics	Science	Hum/SS	Communication	Other
General Education 42 hours	Must take 1 Math (3-4 cr. hrs.) and 1 Science course (3-4 cr. hrs.) plus a Math or Science elective to total 10 credit		ENG 153 ENG 363 PSY 113 SS elective (3)	ENG 103 ENG 113 SP 203	ENG 433 COM 203 COM 363 Gen Ed Elective (2)
Add'l 30					UE 101 Free electives (29)
Content Requirements 48 hours	<p><b>COMPOSITION CORE – 21 HRS.</b>            ENG 133 Technical Communication            ENG 273 Creative Writing            ENG 412 Writing Center Consulting            ENG 411 Writing Center Consulting Lab            ENG 303 Advanced Technical Communication            or ENG 453 Advanced Composition            9 hours of electives in communication courses (selected in consultation with advisor)</p> <ul style="list-style-type: none"> <li>- COM 183 Writing for Media</li> <li>- COM 253 Event Planning and Promotion</li> <li>- COM 343 Web Content Management</li> <li>- COM 353 PR Writing and Production</li> <li>- COM 383 Feature Reporting</li> <li>- COM 413 Corporate and Organizational Communication</li> <li>- COM 483 Public Affairs Reporting</li> <li>- or other communication course approved by advisor</li> </ul> <p><b>LITERATURE CORE – 21 HRS.</b>            ENG 373 Literary Theory – 3 hrs.            Take 3 of these 5 survey courses: - 9 hrs</p> <ul style="list-style-type: none"> <li>- ENG 2013 British Literature I</li> <li>- ENG 2023 British Literature II</li> <li>- ENG 2113 American Literature I</li> <li>- ENG 2123 American Literature II</li> <li>- ENG 253 Readings in World Literature</li> </ul> <p>9 hours of electives in Literature (or other literature course approved by advisor)</p> <ul style="list-style-type: none"> <li>- ENG 233 Mythology</li> <li>- ENG 263 Contemporary Themes in Literature</li> <li>- ENG 3303 The Bible as Literature</li> <li>- ENG 3313 Graphic Novels</li> <li>- ENG 423 Drama</li> <li>- ENG 443 Poetry</li> <li>- FLM 203 Film Appreciation</li> </ul> <p><b>PROGRAM CORE – 6 HRS.</b>            ENG 4013 Capstone Study in English            ENG 4023 Senior Capstone Internship</p>				

**TOTAL IN DEGREE PROGRAM: 120 HRS.**

**DEPARTMENT OF MATHEMATICS, INFORMATICS &  
CYBERSECURITY**

**The Department of Mathematics & Informatics offers the following degree:**

BACHELOR OF SCIENCE WITH MAJORS IN:

- CYBERSECURITY
- INFORMATICS
- MATHEMATICS

## **BACHELOR OF SCIENCE WITH A MAJOR IN CYBERSECURITY**

What is Cybersecurity? According to the United States Computer Emergency Readiness Team, cybersecurity involves protecting information by preventing, detecting and responding to attacks. Our digital society relies on the Internet for communication and to store personal, financial, health and government records. Securing these systems is critical to our privacy, economy and national security.

The major in Cybersecurity prepares graduates to be leaders in the protection of data assets. The curriculum focuses on the techniques, policies, operational procedures, and technologies that secure and defend the availability, confidentiality, integrity, authorization, authentication, and nonrepudiation of information. Students have the opportunity to work toward industry certifications in CompTIA A+, Linux+, Network+, and Security+.

The Cybersecurity program focuses on the theory and application of technical and non-technical security skills. The curriculum features the development of investigative skills along with a focus on communication, critical thinking, mathematics, science, and law. The program covers an array of abilities required to protect, detect, and respond to threats, vulnerabilities, and exploits to the data assets.

As technology becomes more sophisticated, so do the means by which you can be attacked. This is where cybersecurity begins.

### **Program Outcomes/Objectives**

1. Graduates will demonstrate competency in applying the theoretical and problem solving aspects of Cybersecurity and related disciplines.
2. Graduates will demonstrate competency in the practical applications of Cybersecurity.
3. Graduates will effectively communicate technical information in both written and oral form.
4. Graduates will be competent in research methods and be able to critically review research with the intent of applying finding to their practice.
5. Graduates will be prepared to pursue a lifetime of self-directed learning and professional development.
6. Graduates will conduct themselves in a professional and ethical manner.
7. Graduates will be prepared to formulate, update, and communicate short- and long-term organizational Cybersecurity strategies and policies.

**BACHELOR OF SCIENCE – CYBERSECURITY MAJOR**

**120 HRS.**

	Mathematics	Science	Hum/SS	Communication	Other
<b>General Education 42 hours</b>	MA 134 MA164	Lab science elective (4)	PSY 113 GOV 113 PHL 313 ENG 233	ENG 103 ENG 133 SP 203	GOV 403 PSY 343 Gen Ed elective (3)
<b>Content Requirements 67 hours</b>	INF 103 Information Technology Applications INF 143 Introduction to C# INF 183 Introduction to Linux INF 213 Digital Forensic Science I INF 263 Database Concepts & Applications INF 303 Network Management INF 313 Digital Forensic Science II INF 343 Network Security INF 371 Advanced Microcomputer Lab INF 373 Advanced Microcomputers INF 403 Advanced Database INF 433 Data Mining and Data Visualization INF 443 Advanced Cybersecurity Concepts INF 493 Informatics Capstone  LE 103 Introduction to Criminal Justice LE 263 Introduction to Criminal Law & Justice LE 273 Criminal Procedures & Evidence LE 343 Crime Scene Investigation I  MA 203 Discrete Mathematics for Info Science MA 323 Operations Research MA 253 Statistics MA 333 Number Theory MA 433 Intro to Mathematical Cryptography				
<b>Additional 11 hours</b>	EXS 102 Lifetime Wellness PSY 383 Forensic Psychology UE 101 University Experience Free Electives (5)				

**TOTAL IN DEGREE PROGRAM:**

**120 HRS**

## BACHELOR OF SCIENCE WITH A MAJOR IN INFORMATICS

The Informatics 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 Informatics 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 the rapidly emerging field defined as “informatics.”

### BACHELOR OF SCIENCE INFORMATICS MAJOR

**120 HRS.**

	Mathematics	Science	Hum/SS	Communication	Other
<b>General Education</b> 42 hours	Math elective (3)  MA 173	Lab science elective (4)	SS elective (6) HUM elective (6)	ENG 103 ENG 133 SP 203	PSY 113 EXS 102 INF 103 Gen Ed elective (3)
<b>Content Requirements</b> 43 hours	INF 143 Introduction to C# INF 183 Introduction to Linux INF 213 Digital Forensic Science I INF 263 Database Concepts and Applications INF 303 Network Management INF 313 Digital Forensic Science II INF 343 Network Security INF 371 Advanced Microcomputer Lab INF 373 Advanced Microcomputers INF 403 Advanced Database INF 433 Data Mining and Data Visualization INF 493 Informatics Capstone MA 203 Discrete Mathematics for Information Sciences MA 253 Statistics MA 323 Operations Research				
<b>Additional</b> 35 hours	Outside Minor Studies (to be selected) 24-27 hours Electives 7-10 hours UE 101				

**TOTAL IN DEGREE PROGRAM:**

**120 HRS**

**BACHELOR OF SCIENCE WITH A MAJOR IN MATHEMATICS 120 HRS.**

The mathematics curriculum is a broad-based program designed to advance mathematical reasoning and to develop communication skills. Recent graduates of the mathematics program have pursued graduate degrees and some have found employment as mathematics instructors on the college level.

**BACHELOR OF SCIENCE MATHEMATICS MAJOR 120 HRS.**

	Mathematics	Science	Hum/SS	Communication	Other
<b>General Education</b> 42 hours	MA 312	Lab science (4) Lab science (4)	HIS elective (3) SS elective (3) HUM elective (3) HUM elective (3)	ENG 103 ENG 113 SP 203 <u>or</u> COM 163	INF 143 <i>or</i> CS 1113 ENG 153 PSY 113 EXS 102
<b>Content Requirements</b> 38 hours	MA 134 Calculus I MA 164 Calculus II MA 213 Calculus III MA 233 Differential Equations MA 303 College Geometry MA 313 Linear Algebra MA 403 Advanced Calculus Mathematics Electives (15)				
<b>Additional</b> 40 hours	Directed electives (22-26) General Electives (13-17) UE 101 University Experience				

**TOTAL IN DEGREE PROGRAM:**

**120 HRS**

## **DEPARTMENT OF MUSIC**

**The Department of Music offers the following degree:**

BACHELOR OF SCIENCE WITH A MAJOR IN:

- MUSIC WITH AN OUTSIDE MINOR

Music is the movement of sound to reach the soul for the education of its virtue – Plato. Music is a fundamental element of society and as such permeates our lives. Nearly every human environment incorporates music to elicit an emotional, physical, or mnemonic response in the listener.

The Music Department at Trine University enables you to bring the art of music to the world through various areas of employment. We offer a wide range of academic and performance opportunities in the field of music where you can enhance your skills as a vocalist, instrumentalist, musicologist, and/or music theorist and pair them with a variety of university minors. To develop your performance skills Trine University offers wind ensemble, chamber orchestra, two choirs, two jazz bands and is one of only three private universities in Indiana offering marching band. Many small ensembles are also offered such as musical theatre/opera ensemble, percussion ensemble, and others.

### **Explore**

Music and an Outside Minor will provide you with a unique opportunity of training in the areas of performance, musicology, music theory, and the outside field of your choice as it relates to music. The objective is to prepare you for professional employment and for graduate study in both the public and private sectors.

### **Experience**

Music and an Outside Minor will give you the opportunity to pursue an education in music while giving you the additional education to utilize your love of music in professional areas in and outside the performance medium. The combination of music and an outside field of your choosing will prepare you for many careers in the field of the performing arts.

### **Excel**

Music and an Outside Minor will provide you with the opportunity to gain a solid foundation of musicianship through a rigorous program of study. You will enhance your musical skills through private instruction and by performing in large and small ensembles.

**BACHELOR OF SCIENCE—MUSIC WITH AN OUTSIDE MINOR 120 HRS.**

	Mathematics	Science	Hum/SS	Communication	Other
General Education 42 hours	MA 113 <i>or</i> MA 153	BIO 104  MA or SCI elec (3)	MUS 123 MUS 223 SS elective (6)	ENG 103  ENG 113 <i>or</i> ENG 133  SP 203	EXS 102 INF 103  Gen Ed electives (6)
Content Requirements 52 hours	<p><b>UE 101 – University Experience (1)</b></p> <p><b>Music Core Requirements (28)</b>                      MUS 113 Music Theory I                      MUS 101 Sight Singing/Ear Training I                      MUS 201 Sight Singing/Ear Training II                      MUS 213 Music Theory II                      MUS 301 Sight Singing/Ear Training III                      MUS 313 Music Theory III                      MUS 323 Music Literature I                      MUS 363 Recording Techniques/Sound Reinforcement                      MUS 401 Sight Singing/Ear Training IV                      MUS 403 Capstone Course                      MUS 423 Music Literature II                      MUS 433 Music Theory IV</p> <p><b>Music Performance Studies (23)</b>                      MUS 1000 Major Standing Jury                      MUS 1011 Applied Studies I                      MUS 1011 Applied Studies II                      MUS 1011 Applied Studies III                      MUS 1011 Applied Studies IV                      MUS 3000 Upper Division Standing Jury                      MUS 1011 Applied Studies V                      MUS 1011 Applied Studies VI                      MUS 1011 Applied Studies VII                      MUS 1011 Applied Studies VIII                      MUS 112 Piano Class I or MUS 312 Keyboard Studies I                      MUS 212 Piano Class II or MUS 412 Accompaniment Skills                      MUS 253 Techniques of Conducting                      MUS 121 – MUS 191 Large Ensemble I                      MUS 121 – MUS 191 Large Ensemble II                      MUS 121 – MUS 191 Large Ensemble III                      MUS 121 – MUS 191 Large Ensemble IV                      MUS 121 – MUS 191 Large Ensemble V                      MUS 121 – MUS 191 Large Ensemble VI                      MUS 121 – MUS 191 Large Ensemble VII                      MUS 121 – MUS 191 Large Ensemble VIII                      MUS 100, 200, 300, 400 Recital Hour</p>				
Additional 26 hours	<p><b>Outside Minor studies (24)</b>                      To be selected</p> <p><b>Electives (2)</b></p>				

**TOTAL IN DEGREE PROGRAM:**

**120 HRS.**

## **DEPARTMENT OF SCIENCE**

**The Department of Science offers the following degree:**

BACHELOR OF SCIENCE WITH A MAJOR IN:

- BIOLOGY
- \*\*\*BIOLOGY PRE-PHYSICAL THERAPY (DPT 3+3)
- CHEMISTRY
- FORENSIC SCIENCE
  - BIOLOGY CONCENTRATION
  - CHEMISTRY CONCENTRATION

**The Department of Science also helps to coordinate the following programs:**

- PRE-MED PROFESSIONAL TRACK (See School of Health Sciences)
- PRE-PHYSICAL THERAPY PROFESSIONAL TRACK (See School of Health Sciences)

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 or primary teaching area in addition to SCI 412 Senior Research Seminar and SCI 422 Senior Research Project or SCI 434 Science Internship.

\*\*\*Effective 7/29/2014, the Doctor of Physical Therapy Program at Trine University has been granted Candidate for Accreditation status by the Commission on Accreditation in Physical Therapy Education (1111 North Fairfax Street, Alexandria, VA, 22314; phone: 703-706-3245; email: accreditation@apta.org). Candidate for Accreditation is a pre-accreditation status of affiliation with the Commission on Accreditation in Physical Therapy Education that indicates that the program may matriculate students in technical/professional courses and that the program is progressing toward accreditation. Candidate for Accreditation is not an accreditation status nor does it assure eventual accreditation.

**BACHELOR OF SCIENCE – BIOLOGY MAJOR**

**120 HRS**

	Mathematics	Science	Hum/SS	Communication	Other
<b>General Education</b> 42 hours	MA 113 MA 253	BIO 114	ENG 153 HUM elective (3)  PSY 113/113H SS elective (3)	ENG 103  ENG 113 <i>or</i> ENG 133  SP 203 <i>or</i> COM 163	CH 104 CH 114  INF 103
<b>Additional</b> 37 hours					EXS 102  UE 101  Electives (34)
<b>Program Requirements</b> 41 hours	<p><b>Required Science Courses</b>                      BIO 124 Principles of Biology II                      Choose either the two 2-credit senior research classes or the 4-credit internship                      SCI 412 Senior Research Seminar <i>and</i> SCI 422 Senior Research project  <i>or</i>                      SCI 434 Science Internship</p> <p><b>Choose one of the following physiology classes:</b>                      BIO 283 Marine Biology                      BIO 304 Plant Biology                      BIO 354 Human Physiology                      BIO 343 Cell Biology                      BIO 404 Embryology</p> <p><b>Choose one of the following ecology classes:</b>                      BIO 213 Conservation                      BIO 274 General Ecology                      BIO 334 Environmental Biology</p> <p><b>Choose one of the following organism classes:</b>                      BIO 283 Marine Biology                      BIO 304 Plant Biology                      BIO 314 Animal Biology                      BIO 324 Microbiology</p> <p><b>Biology Electives:</b> Additional BIO courses to bring the total Subject Area Requirements to 41 credit hours</p>				

**TOTAL IN DEGREE PROGRAM:**

**120 HRS**

### 3 + 3 DEGREE PATH FOR A BACHELOR OF SCIENCE IN BIOLOGY & A DOCTORATE IN PHYSICAL THERAPY\*\*\*

#### RECOMMEND SEQUENCE OF COURSES

<b>FRESHMAN FALL</b>	
BIO 114 Biology	4
ENG 103 English Composition I	3
INF 103 Information Application	3
MA 124 Pre-calculus	4
UE 101 University Experience	1
<b>Total Credits</b>	<b>15</b>
<b>FRESHMAN SPRING</b>	
BIO 124 Principles of Biology II	4
CH 104 General Chemistry I	4
ENG 113 English Composition II	3
EXS 102 Lifetime Wellness	2
PSY 112 Principles of Psychology	3
<b>Total Credits</b>	<b>16</b>
<b>SOPHOMORE FALL</b>	
BIO 254 Human Anatomy	4
BIO 334 Environmental Biology	4
CH 114 General Chemistry II	4
SP 203 or COM 163	3
<b>Total Credits</b>	<b>15</b>
<b>SOPHOMORE SPRING</b>	
BIO 324 Microbiology	4
ENG 153 Introduction to Literature	3
HE XX3 Humanities Elective	3
MA 253 Statistics	3
Social Science elective	3
<b>Total Credits</b>	<b>16</b>
<b>JUNIOR FALL</b>	
BIO 343 Cell Biology	3
BIO 414 Genetics	4
BIO XX4 Biology Elective	4
PH 154 College Physics I	4
<b>Total Credits</b>	<b>15</b>
<b>JUNIOR SPRING</b>	
BIO 354 Human Physiology	4
BIO 354 College Physics II	4
BIO 364 Toxicology	4
ENG 453 Advanced Composition	3
<b>Total Credits</b>	<b>15</b>

<b>Courses to Complete for BS Biology</b>		
BIO XX3	Biology Elective	3
	Electives	21
SCI 4004	Senior Internship	4

→ **DPT Program Acceptance**

<b>JUNIOR SUMMER</b>	
SCI 4004	Senior Internship

**Courses to Complete BS Biology  
Pre-Physical Therapy Emphasis  
as Part of 1<sup>st</sup> Year of DPT Program**

<b>DPT FALL I</b>		
DPT 5111	CARE I	1
DPT 5124	Anatomy of Movement 1	4
DPT 5134	Applied Physiology I	4
DPT 5143	Clinical Practice I	3
<b>Total Credits</b>		<b>12</b>

<b>DPT SPRING I</b>		
DPT 5224	Anatomy of Movement II	4
DPT 5234	Applied Physiology II	4
DPT 5254	Applied Neuroscience	4
<b>Total Credits</b>		<b>12</b>

**BACHELOR OF SCIENCE-CHEMISTRY MAJOR****120 HRS**

	Mathematics	Science	Hum/SS	Communication	Other
General Education 42hours	MA 113 MA 123	CH 104	ENG 153 HUM elective (3)  PSY 113/113H SS elective (3)	ENG 103  ENG 113 <i>or</i> ENG 133  SP 203 <i>or</i> COM 163	CH 114  INF 103  MA 134
Add'l 27hours					EXS 102  UE 101  Electives (24)
Program Requirements 51 hours	CH 203 Organic Chemistry CH 211 Organic Chemistry I Laboratory CH 213 Organic Chemistry II CH 221 Organic Chemistry II Laboratory CH 234 Quantitative Chemical Analysis CH 244 Inorganic Chemistry CH 324 Chemical Instrumental Analysis and Laboratory CH 351 Physical Chemistry I Laboratory CH 353 Physical Chemistry I CH 361 Physical Chemistry II Laboratory CH 363 Physical Chemistry II CH 434 Biochemistry  MA 164 Calculus II MA 213 Calculus III  PH 224/224H University Physics I and Laboratory PH 234/234H University Physics II and Laboratory  SCI 412 Senior Research Seminar <i>and</i> SCI 422 Senior Research Project <i>or</i> SCI 434 Science Internship				

**TOTAL IN DEGREE PROGRAM:****120 HRS**

**BACHELOR OF SCIENCE-**

**FORENSIC SCIENCE MAJOR - BIOLOGY CONCENTRATION**

**124 HRS**

	Mathematics	Science	Hum/SS	Communication	Other
General Education 42 hours	MA 124	CH 104 CH 114	ENG 153 HUM elective (3) PSY 113/113H SS elective (3)	ENG 103 ENG 113 <i>or</i> ENG 133 SP 203	EXS 102 INF 103 MA 134
Add'l 4					LE 273 UE 101
Content Requirements 78 hours	<p><b><u>Natural Science Courses (27)</u></b>                      BIO 114 Principles of Biology                      BIO 254 Anatomy                      CH 203 Organic Chemistry I                      CH 211 Organic Chemistry I Laboratory                      CH 213 Organic Chemistry II                      CH 221 Organic Chemistry II Laboratory                      MA 253 Statistics                      PH 154 College Physics I                      PH 164 College Physics II</p> <p><b><u>Specialized Science Courses (12)</u></b>                      BIO 414 Genetics                      CH 234 Quantitative Chemical Analysis                      CH 434 Biochemistry</p> <p><b><u>Forensic Science Courses (20)</u></b>                      BIO 374 Forensic Biology                      FS 203 Principles of Forensic Science I                      FS 223 Principles of Forensic Science II                      FS 423 Professional Practice in Forensic Science                      FS 373 Forensic comparative Science                      SCI 434 Science Internship</p> <p><b><u>Additional Courses (19)</u></b>                      BIO 324 Microbiology                      BIO 343 Cell Biology                      BIO 443 Pathology                      BIO 454 Molecular Biology                      CH 324 Chemical Instrumental Analysis and Laboratory                      FS 351 Criminalistics and Crime Scene Laboratory</p>				

**TOTAL IN DEGREE PROGRAM:**

**124 HRS.**

**BACHELOR OF SCIENCE-  
FORENSIC SCIENCE MAJOR- CHEMISTRY CONCENTRATION 125 HRS.**

	Mathematics	Science	Hum/SS	Communication	Other
General Education 42 hours	MA 134	CH 104 CH 114	ENG 153 HUM elective (3) PSY 113/113H SS elective (3)	ENG 103 ENG 113 <i>or</i> ENG 133 SP 203	EXS 102 INF 103 MA 164
Add'l 4					LE 273 UE 101
Content Requirements 79 hours	<p><b><u>Natural Science Courses (26)</u></b>                      BIO 114 Principles of Biology</p> <p>CH 203 Organic Chemistry I                      CH 211 Organic Chemistry I Laboratory                      CH 213 Organic Chemistry II                      CH 221 Organic Chemistry II Laboratory</p> <p>MA 253 Statistics                      MA 213 Calculus III</p> <p>PH 224/224H University Physics I and Laboratory                      PH 234/234H University Physics II and Laboratory</p> <p><b><u>Specialized Science Courses (12)</u></b>                      CH 234 Quantitative Chemical Analysis                      CH 244 Inorganic Chemistry                      CH 434 Biochemistry</p> <p><b><u>Forensic Science Courses (20)</u></b>                      CH 374 Forensic Chemistry                      FS 203 Principles of Forensic Science I                      FS 223 Principles of Forensic Science II                      FS 423 Professional Practice in Forensic Science                      FS 373 Forensic Comparative Science                      SCI 434 Science Internship</p> <p><b><u>Additional Courses (21)</u></b>                      BIO/CH 364 Toxicology                      CH 324 Chemical Instrumental Analysis and Laboratory                      CH 351 Physical Chemistry I Laboratory                      CH 353 Physical Chemistry I                      CH 424 Advanced Instrumental Analysis                      CH 474 Advanced Forensic Chemistry                      FS 351 Criminalistics and Crime Scene Laboratory</p>				

**TOTAL IN DEGREE PROGRAM: 125 HRS.**

## **KETNER SCHOOL OF BUSINESS**

**Trine University's Ketner School of Business includes two departments:**

- DEPARTMENT OF APPLIED BUSINESS
- DEPARTMENT OF MANAGEMENT

**The Ketner School of Business administers these academic programs:**

**BACHELOR OF SCIENCE IN BUSINESS ADMINISTRATION MAJORS**

- ACCOUNTING
- BUSINESS ADMINISTRATION
- FINANCE
- GOLF MANAGEMENT
- HOSPITALITY AND TOURISM
- MANAGEMENT
- MARKETING
- SPORT MANAGEMENT

**ASSOCIATE DEGREES**

- ACCOUNTING
- BUSINESS ADMINISTRATION

**MINORS \*SEE PAGE 96**

- ACCOUNTING
- BUSINESS
- ECONOMICS
- ENTREPRENEURSHIP
- FINANCE
- GOLF MANAGEMENT
- LEADERSHIP
- MANAGEMENT
- MARKETING

### **THE SCHOOL**

Trine University's Ketner School of Business 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 US'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 school's oldest continuous course of study.

The Ketner School of Business at Trine University is accredited by the Accreditation Council for Business Schools and Programs (ACBSP), [www.acbsp.org](http://www.acbsp.org), for the following majors: Accounting, Business Administration, Finance, Golf Management, Management, Marketing, and Sport Management.

### **MISSION**

The mission of the Trine University Ketner School of Business is to prepare students for professional careers in business and related fields and to assist them in personal and professional development.

## **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 minors 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).

In cooperation with the School of Engineering, the Ketner School of Business offers a minor in entrepreneurship. The entrepreneurship minor is designed for students who have an interest in owning a business at some point in the future. The entrepreneurship minor is available for all Trine University students regardless of major. Information regarding the [entrepreneurship minor](#) is found on page 102 of this catalog.

## **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. Students are expected to earn a grade of “C” or better in all courses required for their major.

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 shall 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.

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.

Internships are quickly becoming a requirement before a student can be considered for a permanent position by many companies.

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 (3) semester hours.) Internships can take place during any semester but are especially encouraged during the summer. Prerequisites include a 2.5 GPA or higher, sophomore or above class standing, and recommendation and approval by the Dean of the Ketner School of Business.

## PREPARATION PROGRAM FOR NON-BUSINESS MAJORS WHO WISH TO PURSUE A MASTER'S OF BUSINESS ADMINISTRATION (MBA)

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

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	303	Marketing	(3)

## KETNER SCHOOL OF BUSINESS ASSOCIATE DEGREES

### ASSOCIATE IN ACCOUNTING

**60 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 Catalog 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.

### ASSOCIATE OF SCIENCE IN ACCOUNTING

**60 HRS.**

	<b>Mathematics (3/4 hrs.)</b>	<b>Science (3/4hrs.)</b>	<b>Hum/SS (6 hrs.)</b>	<b>Communication (6 hrs.)</b>	<b>Other (3 hrs)</b>
<b>General Education 22 hours</b>	MA 113 Math or Science elective (1)	SCI elective (3) Science or Math Elective (1)	HUM elective (3) ECO 213 Or ECO 223	ENG 103 ENG 113	SP 203
<b>Additional Requirements 8 hours</b>	BA 101 University Experience (Main Campus students) Or UE 111 Adult Learning Orientation (SPS students)  BA 301 Professional Development & Strategies  <i>Select two of the following courses (6 hrs)</i> BA 113 Business Applications And/Or COM 213 Business Communication And/Or PSY 113 Psychology				
<b>Program Requirements 30 hours</b>	<u><b>Associate Business Core 15 hrs.</b></u> AC 203 Accounting I AC 213 Accounting II BA 123 Business Concepts LAW 203 Business Law I MK 203 Marketing  <u><b>Concentration Requirements 15 hrs.</b></u> AC 303 Cost Accounting AC 323 Intermediate Accounting I AC 333 Intermediate Accounting II AC 373 Accounting information Systems AC 423 Personal Income Tax Or AC 463 Auditing				

### ASSOCIATE OF SCIENCE IN ACCOUNTING

**60 HRS.**

**ASSOCIATE OF SCIENCE IN BUSINESS ADMINISTRATION 60 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 course work 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.

	<b>Mathematics (3/4 hrs.)</b>	<b>Science (3/4 hrs.)</b>	<b>Hum/SS (6 hrs.)</b>	<b>Communication (6 hrs.)</b>	<b>Other (3 hrs.)</b>
<b>General Education 22 hours</b>	MA 113 Math or Science elective (1)	SCI elective (3) Science or Math Elective (1)	ECO 213 OR ECO 223 HUM elective (3)	ENG 103 ENG 113	SP 203
<b>Additional Requirements 8 hours</b>	BA 101 University Experience (Main Campus students) Or UE 111 Adult Learning Orientation (SPS students)  BA 301 Professional Development & Strategies  <i>Select two of the following courses (6 hrs)</i> BA 113 Business Applications And/Or COM 213 Business Communication And/Or PSY 113 Psychology				
<b>Program Requirements 30 hours</b>	<u><b>Business Core (15 hrs.)</b></u> AC 203 Accounting I AC 213 Accounting II BA 123 Business Concepts LAW 203 Business Law I MK 203 Marketing  <u><b>Business Concentration (15 hrs.)</b></u> MGT 363 Organizational Behavior Electives (12 hrs.) - (prefixed AC, BA, INF, ECO, FIN, LAW, MGT, MK)				

**ASSOCIATE OF SCIENCE IN BUSINESS ADMINISTRATION 60 HRS.**

**DEPARTMENT OF APPLIED BUSINESS**

**The Department of Applied Business offers the following bachelor degrees:**

BACHELOR OF SCIENCE IN BUSINESS ADMINISTRATION WITH A MAJOR IN:

- ACCOUNTING
- FINANCE
- MARKETING

**CURRICULUM**

A specified number of credit hours must be taken in each section described below. Prerequisites as shown in the course description section of this catalog must be carefully observed. Excess credit hours in a section may not ordinarily be counted toward requirements in another section; excess credit hours may be counted under the non-specified electives category.

**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 education, 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.

**BACHELOR OF SCIENCE IN BUSINESS ADMINISTRATION**

**ACCOUNTING MAJOR**

**120 HRS.**

	<b>Mathematics (9 hrs.)</b>	<b>Science (3 or 4 hrs.)</b>	<b>Hum/SS (12 hrs.)</b>	<b>Communication (9 hrs.)</b>	<b>Other (8 or 9 hrs.)</b>
<b>General Education 42 hours</b>	MA 113 MA 173 MA 253	SCI elective w/out lab (3) with lab (4)	ECO 213 ECO 223 HUM elective (3) Foreign Language (3)	ENG 103 ENG 113 SP 203	PSY 113 BA 113 Gen Ed elective (2 or 3) <small>(If 3 hrs. of Science chosen need to choose 3 hr. elective here)</small>
<b>Additional Requirements 15 hours</b>	BA 101 University Experience (Main Campus students) Or UE 111 Adult Learning Orientation (SPS students) BA 123 Business Concepts BA 213 Advanced Spreadsheet for Business BA 301 Professional Development and Strategies COM 213 Business Communication Free electives (4)				
<b>Program Requirements 63 hours</b>	<p><b><u>Business Core (30 hrs.)</u></b></p> <p>AC 203 Accounting I AC 213 Accounting II BA 343 International Business FIN 303 Managerial Finance LAW 203 Business Law I MGT 353 Designing Operations MGT 363 Organizational Behavior MGT 453 Strategic Management MK 203 Marketing MGT 473 CAPSIM Business Simulation Or BA 3113 Business Internship (Advisor will determine the appropriate class)</p> <p><b><u>Concentration Requirements (33 hrs.)</u></b></p> <p>AC 303 Cost Accounting AC 323 Intermediate Accounting I AC 333 Intermediate Accounting II AC 373 Accounting information Systems AC 403 Advanced Accounting AC 423 Personal Income Tax AC 463 Auditing FIN 413 Corporate Finance Business Electives - 6 hrs. (300-400 level from AC or FIN) Business Elective -3 hrs. (any business elective in the 300 - 400 level)</p>				

**TOTAL IN PROGRAM**

**120 HRS.**

**BACHELOR OF SCIENCE IN BUSINESS ADMINISTRATION**

**FINANCE MAJOR**

**120 HRS.**

The finance major provides students with a working understanding of the financial decision-making process, how financial markets function, and the acquisition and management of capital. Students may elect course concentrations in investment analysis and portfolio management, financial institutions and services, or corporate financial management. Students will be prepared for a variety of careers in business and in the government sector in areas such as financial analysis, capital budgeting, banking, mergers and acquisitions, cash management, financial planning, investment analysis and portfolio management, brokerage, real estate and insurance. A major in finance is also excellent preparation for graduate study in finance, business administration, or corporate and securities law.

	<b>Mathematics (6 hrs.)</b>	<b>Science (3 or 4 hrs.)</b>	<b>Hum/SS (12 hrs.)</b>	<b>Communication (9 hrs.)</b>	<b>Other (11 or 12 hrs.)</b>
<b>General Education 42 hours</b>	MA 113 MA 173	SCI elective w/out lab (3) with lab (4)	ECO 213 ECO 223 HUM elective (3) Foreign Language (3)	ENG 103 ENG 113 SP 203	MA 253 PSY 113 BA 113 Gen Ed elective (2 or 3) (If 3 hrs. of Science chosen need to choose 3 hr. elective here)
<b>Additional Requirements 11 hours</b>	BA 101 University Experience BA 123 Business Concepts BA 213 Advanced Spreadsheets for Business BA 301 Professional Development and Strategies COM 213 Business Communication				
<b>4</b>	<b>Free Electives (4)</b>				
<b>Program Requirements 63 hours</b>	<p><b><u>Business Core (30 Hrs.)</u></b>                      AC 203 Accounting I                      AC 213 Accounting II                      BA 343 International Business                      FIN 303/H Managerial Finance Honors                      LAW 203 Business Law I                      MGT 353 Designing Operations                      MGT 363 Organizational Behavior                      MGT 453 Strategic Management                      MGT 473 CAPSIM Business Simulation                      Or                      BA 3113 Business Internship (Advisor will determine the appropriate class)                      MK 203 Marketing</p> <p><b><u>Concentration Requirements (33)</u></b>                      AC 303 Cost Accounting                      AC 423 Personal Income Tax                      FIN 323 Money and Banking                      FIN 343 International Finance                      FIN 373/ECO 373 Introduction to Econometrics                      FIN 403 Investments                      FIN 413 Corporate Finance                      FIN 473 Financial Modeling                      Finance Electives (300/400 level) (3)                      Business Electives (300/400 from FIN, AC courses or BA 313, BA 323, ENT 423) (6)</p>				

**TOTAL IN DEGREE PROGRAM:**

**120 HRS.**

**BACHELOR OF SCIENCE IN BUSINESS ADMINISTRATION  
MARKETING MAJOR**

**120 HRS.**

Marketing encompasses the functions of 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.

	Mathematics	Science	Hum/SS	Communication	Other
General Education 42 hours	MA 113 MA 173	Science Elective With Lab (4)	ECO 213 ECO 223 HUM elective (3) Foreign Language (3)	ENG 103 ENG 113 SP 203	MA 253 PSY 113 BA 113 Gen Ed elective (2)
Additional Requirements 11 hours	BA 101 University Experience BA 123 Business Concepts BA 213 Advanced Spreadsheets for Business BA 301 Professional Development and Strategies COM 213 Business Communication				
Free Electives 4 hours	<u>Free Electives</u>				
Program Requirements 63 hours	<p><b><u>Business Core (30 hrs)</u></b>                      AC 203 Accounting I                      AC 213 Accounting II                      BA 343 International Business                      FIN 303 Managerial Finance                      LAW 203 Business Law I                      MGT 353 Designing Operations                      MGT 363 Organizational Behavior                      MGT 453 Strategic Management                      MK 203 Marketing                      MGT 473 CAPSIM Business Simulation                      Or                      BA 3113 Business Internship (Advisor will determine the appropriate class)</p> <p><b><u>Concentration Requirements (33 hrs)</u></b>                      BA 403 Business and Public Policy                      ENT 303 Entrepreneurial Leadership                      MK 313 Retail Management                      MK 323 Integrated Marketing Communications                      MK 363 Buyer Behavior                      MK 423 Personal Selling                      MK 463 Marketing Research                      Select any two (300-400 level from BA, COM, ENT, MGT, MK) (6)                      Business Electives (300-400 level from AC, BA, ENT, FIN, LAW, MGT, MK) (6)</p>				

**TOTAL IN DEGREE PROGRAM:**

**120 HRS.**

## **DEPARTMENT OF MANAGEMENT**

**The Department of Management offers the following degrees:**

BACHELOR OF SCIENCE IN BUSINESS ADMINISTRATION WITH A MAJOR IN:

- BUSINESS ADMINISTRATION
- GOLF MANAGEMENT
- HOSPITALITY AND TOURISM
- MANAGEMENT
- SPORT MANAGEMENT

### **CURRICULUM**

A specified number of credit hours must be taken in each section described below. Prerequisites as shown in the course description section of this catalog must be carefully observed. Excess credit hours in a section may not ordinarily be counted toward requirements in another section; excess credit hours may be counted under the non-specified electives category.

**BACHELOR OF SCIENCE IN BUSINESS ADMINISTRATION  
BUSINESS ADMINISTRATION MAJOR**

**120 HRS.**

The Bachelor of Science in Business Administration prepares capable students for responsible positions in business, industry, and public service. A student who does not choose to follow a major/concentration track will take all General Education courses and all Business Core courses. The remaining credit hours will be determined by the student and their advisor with all major business courses at the 300 and 400 level.

	Mathematics	Science	Hum/SS	Communication	Other
<b>General Education</b> 42 hours	MA 113 MA 173	SCI elective with lab (4)	ECO 213 ECO 223 HUM elective (3) Foreign Language (3)	ENG 103 ENG 113  SP 203	MA 253 PSY 113 BA 113  Gen Ed elective (2)
<b>Additional Requirements</b> 11 hours	BA 101 University Experience BA 123 Business Concepts BA 213 Advanced Spreadsheet for Business BA 301 Professional Development and Strategies COM 213 Business Communication				
<b>Free Electives</b> 4 hours	Free Electives (4)				
<b>Program Requirements</b> 63 hours	<p><b><u>Business Core (30 hrs)</u></b> AC 203 Accounting I AC 213 Accounting II BA 343 International Business FIN 303 Managerial Finance LAW 203 Business Law I MGT 353 Designing Operations MGT 363 Organizational Behavior MGT 453 Strategic Management MK 203 Marketing MGT 473 CAPSIM Business Simulation Or BA 3113 Business Internship (Advisor will determine the appropriate class)</p> <p><b><u>Concentration Requirements (33 hrs)</u></b> Business Electives (300-400) with the approval of Advisor and Chair (33)</p>				

**TOTAL IN DEGREE PROGRAM:**

**120 HRS.**

**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 expanding golfing industry. The program incorporates a business administration core with a concentration in golf management course work, including golf course promotion, turf management and marketing strategies.

	Mathematics	Science	Hum/SS	Communication	Other
General Education 42 hours	MA 113 MA 173	SCI elective with lab (4)	ECO 213 ECO 223 HUM elective (3) Foreign Language (3)	ENG 103 ENG 113 SP 203	MA 253 PSY 113 BA 113 EXS 102
Additional Requirement 10 hours	BA 123 Business Concepts BA 213 Advance Spreadsheet for Business BA 301 Professional Development and Strategies COM 213 Business Communication				
Program Requirements 68 hours	<p><b><u>Business Core (30 hrs)</u></b>                      AC 203 Accounting I                      AC 213 Accounting II                      BA 343 International Business                      FIN 303 Managerial Finance                      LAW 203 Business Law I                      MGT 353 Designing Operations                      MGT 363 Organizational Behavior                      MGT 453 Strategic Management                      MK 203 Marketing                      MGT 473 CAPSIM Business Simulation                      Or                      BA 3113 Business Internship (Advisor will determine the appropriate class)</p> <p><b><u>Concentration Requirements (38 hrs)</u></b>                      GM 101 Introduction to Golf Management                      GM 131 Player Development I                      GM 203 Golf Shop Management                      GM 213 Golf Club Design, Repair and Fitting                      GM 223 Promotion and Marketing of Golf Facilities                      GM 231 Player Development II                      GM 303 Teaching the Short Game                      GM 323 Teaching the Golf Swing                      GM 331 Player Development III                      GM 343 Golf Facility Operations                      GM 411 Food and Beverage Management                      GM 431 Player Development IV                      GM 452 Golf Management Leadership                      MK 363 Buyer Behavior                      MK 423 Personal Selling                      SM 393 Sport Psychology                      SM 253 Risk Management</p>				

**TOTAL IN DEGREE PROGRAM:**

**120 HRS.**

**BACHELOR OF SCIENCE IN BUSINESS ADMINISTRATION  
HOSPITALITY AND TOURISM MAJOR**

**120 HRS.**

	<b>Mathematics (6)</b>	<b>Science (4)</b>	<b>Hum/SS (12)</b>	<b>Communication (9)</b>	<b>Other (11)</b>
<b>General Education 42 hours</b>	MA 113 MA 173	SCI elective with lab (4)	ECO 213 ECO 223 HUM elective (3) Foreign Language (3)	ENG 103 ENG 113 COM 163 Or SP 203	MA 253 PSY 113 BA 113 EXS 102
<b>Program Requirements 78 hours</b>	<p><b><u>Business Core (30)</u></b>                      AC 203 Accounting I                      AC 213 Accounting II                      BA 343 International Business                      FIN 303 Managerial Finance                      LAW 203 Business Law I                      MGT 353 Designing Operations                      MGT 363 Organizational Behavior                      MGT 453 Strategic Management                      MK 203 Marketing                      MGT 473 CAPSIM Business Simulation                      Or                      BA 3113 Business Internship (Advisor will determine the appropriate class)</p> <p><b><u>Concentration Requirements (35)</u></b>                      EXS 273 Nutrition                      HOS 103 Current trends in Tourism                      HOS 203 Lodging Management                      HOS 303 Hospitality and Tourism Marketing                      HOS 313 Catering                      HOS 322 Meeting and Event Planning                      HOS 402 Beverage Management                      HOS 404 Quality Food Preparation                      HOS 404L Quality Food Preparation Lab                      HOS 413 Casino, Spa, and Resort Management                      HOS 423 Sanitation and health in the food service, lodging, and tourism industry                      MGT 313 Human Resource Management                      SM 253 Risk Management</p> <p><b><u>Additional Requirements (13)</u></b>                      BA 101 University Experience for Business Majors                      BA 301 Professional Development and Strategies                      BA 123 Business Concepts                      BA 213 Advanced Spreadsheets for Business                      COM 213 Business Communication                      EXS 102 Lifetime Wellness                      Free Elective (2)</p>				

**TOTAL IN DEGREE PROGRAM:**

**120 HRS.**

**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.

	Mathematics	Science	Hum/SS	Communication	Other
General Education 42 hours	MA 113 MA 173	SCI elective with lab (4)	ECO 213 ECO 223 HUM elective (3) Foreign Language (3)	ENG 103 ENG 113 SP 203	MA 253 PSY 113 BA 113 Gen Ed electives (2)
Free Electives 4 hrs	Free Electives (4)				
Additional Requirements 11 hours	BA 101 University Experience BA 123 Business Concepts BA 213 Advance Spreadsheet for Business BA 301 Professional Development and Strategies COM 213 Business Communication				
Program Requirements 63 hours	<p><b><u>Business Core (30 hrs.)</u></b>                      AC 203 Accounting I                      AC 213 Accounting II                      BA 343 International Business                      FIN 303 Managerial Finance                      LAW 203 Business Law I                      MGT 353 Designing Operations                      MGT 363 Organizational Behavior                      MGT 453 Strategic Management                      MK 203 Marketing                      MGT 473 CAPSIM Business Simulation                      Or                      BA 3113 Business Internship (Advisor will determine the appropriate class)</p> <p><b><u>Concentration Requirements (33 hrs)</u></b>                      BA 403 Business and Public Policy                      ENT 303 Entrepreneurial Leadership                      Or                      MGT 323 Leadership                      MGT 313 Human Resource Management                      MGT 343 Human Resource Development                      MGT 413 Management of Quality                      MGT 443 Managing Operations                      MK 363 Buyer Behavior                      MK 423 Personal Selling                      Management elective (3)                      Business electives ( 300/400 level from AC, BA, ENT, FIN, LAW, MGT, MK) (6)</p>				

**TOTAL IN DEGREE PROGRAM:**

**120 HRS.**

**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 growing demand in collegiate and professional sports for business professionals who possess an extensive knowledge of sports 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.

	Mathematics	Science	Hum/SS	Communication	Other
General Ed. 42 hours	MA 113 MA 173	BIO 104	ECO 213 ECO 223 HUM elective (3) Foreign Language (3)	ENG 103 ENG 113 SP 203	MA 253 PSY 113 BA 113 EXS 102
Additional Requirements 11 hours	BA 101 University Experience BA 123 Business Concepts BA 213 Advanced Spreadsheet for Business BA 301 Professional Development and Strategies COM 213 Business Communication				
Free Electives 4 hours	<b><u>Free Electives (4)</u></b>				
Program Requirements 63 hours	<b><u>Business Core</u></b> AC 203 Accounting I AC 213 Accounting II BA 343 International Business FIN 303 Managerial Finance LAW 203 Business Law I MGT 353 Designing Operations MGT 363 Organizational Behavior MGT 453 Strategic Management MK 203 Marketing MGT 473 CAPSIM Business Simulation Or BA 3113 Business Internship (Advisor will determine the appropriate class) <b><u>Concentration Requirements</u></b> LDR 203 Leadership Strengths and Skills MK 323 Integrated Marketing SM 133 Contemporary Issues and Sports SM 223 History of Sport SM 253 Risk Management SM 313 Principal of Sport and Recreation Management SM 393 Sport Psychology SM 404 Capstone in Sport Management SM 412 Business Planning in Sport and Recreation SM 413 Organization and Administration of Physical Education and Athletics SM 453 Facility Planning				

**TOTAL IN DEGREE PROGRAM:**

**120 HRS.**

## **SCHOOL OF HEALTH SCIENCES**

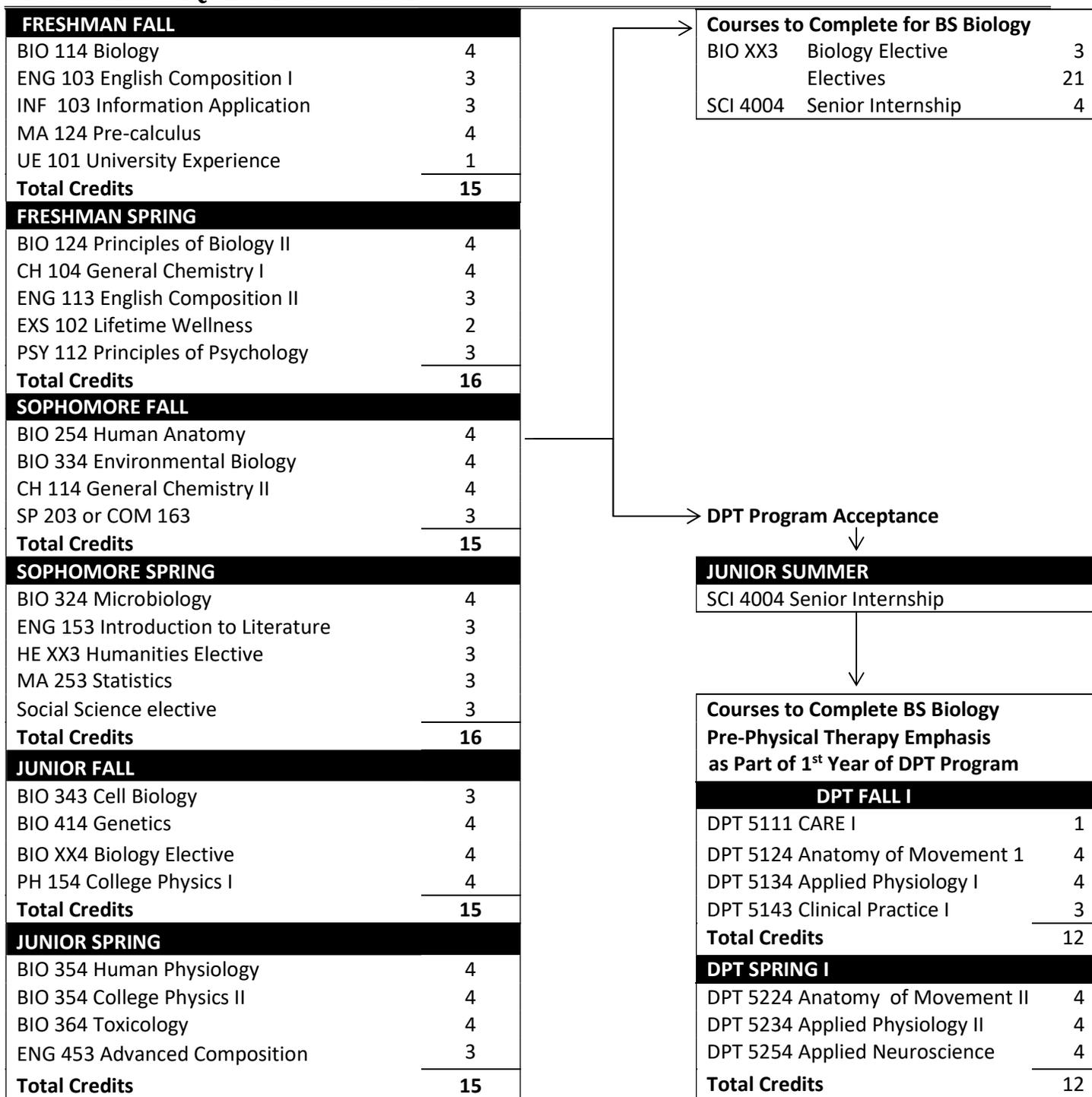
**Trine University's School of Health Sciences includes:**

- **\*\*DOCTORATE OF PHYSICAL THERAPY**
  
- DEPARTMENT OF EXERCISE SCIENCE
  
- BACHELOR OF SCIENCE WITH A MAJOR IN:  
EXERCISE SCIENCE
  
- 3 + 3 PROGRAMS  
BACHELOR OF SCIENCE IN BIOLOGY AND A DOCTORATE OF PHYSICAL THERAPY  
BACHELOR OF SCIENCE IN EXERCISE SCIENCE AND A DOCTORATE OF PHYSICAL  
THERAPY
  
- PROFESSIONAL TRACKS  
PRE-MED PROFESSIONAL TRACK  
PRE-PHYSICAL THERAPY PROFESSIONAL TRACK
  
- [MINORS](#)  
ATHLETIC TRAINING

\*\*Effective 7/29/2014, the Doctor of Physical Therapy Program at Trine University has been granted Candidate for Accreditation status by the Commission on Accreditation in Physical Therapy Education (1111 North Fairfax Street, Alexandria, VA, 22314; phone: 703-706-3245; email: accreditation@apta.org). Candidate for Accreditation is a pre-accreditation status of affiliation with the Commission on Accreditation in Physical Therapy Education that indicates that the program may matriculate students in technical/professional courses and that the program is progressing toward accreditation. Candidate for Accreditation is not an accreditation status nor does it assure eventual accreditation.

## 3 + 3 DEGREE PATH FOR A BACHELOR OF SCIENCE IN BIOLOGY & A DOCTORATE IN PHYSICAL THERAPY

### RECOMMEND SEQUENCE OF COURSES



### 3 + 3 DEGREE PATH FOR A BACHELOR OF SCIENCE IN EXERCISE SCIENCE & A DOCTORATE IN PHYSICAL THERAPY

#### RECOMMEND SEQUENCE OF COURSES

<b>FALL I</b>	
UE 101 University Experience	1
ENG 103 English Composition I	3
EXS 103 Teaching of Sport Skills I	3
BIO 114 Biology	4
MA 113 College Algebra	3
EXS 102 Lifetime Wellness	2
<b>Total Credits</b>	<b>16</b>
<b>SPRING I</b>	
EXS 123 Teaching of Sport Skills II	3
ENG 113 English Composition II	3
PSY 113 Principles of Psychology	3
MA 123 Trigonometry	3
BIO 124 Principles of Biology II	4
<b>Total Credits</b>	<b>16</b>
<b>FALL II</b>	
CH 104 General Chemistry I (or honors)	4
SP 203 Effective Speaking	3
Humanities elective	3
EXS 243 Athletic Training	3
Social Science elective	3
<b>Total Credits</b>	<b>16</b>
<b>SPRING II</b>	
CH 114 General Chemistry II (or honors)	4
PH 154 College Physics I	4
EXS 332 Drug Education*	2
EXS 273 Nutrition	3
Humanities elective	3
<b>Total Credits</b>	<b>16</b>
<b>FALL III</b>	
PH 164 College Physics II	4
BIO 254 Human Anatomy	4
EXS 383 Nutrition Counseling	3
EXS 333 Kinesiology	3
EXS 373 Health Problems	3
<b>Total Credits</b>	<b>17</b>
<b>SPRING III</b>	
BIO 354 Human Physiology	4
MA 253 Statistics	3
EXS 353 Exercise Physiology	3
EXS 463 Motor Learning	3
ENG 453 Advanced Composition	3
<b>Total Credits</b>	<b>16</b>

<b>Courses to Complete for BS Ex. Science</b>		
SM 253	Risk Management	3
SM 313	Principles of Sprt & Rec	3
EXS 402	Exercise Leadership	2
SM 412	Bus Plng in Sprt & Rec	2
EXS 433	Dev Health Prom	3
EXS 452	Fitness Eval Assmt	2
EXS 464	Capstone	4
EXS 474	Internship	4
EXS 493	Personal Training	3
		<b>26</b>

<b>Courses to Complete BS Ex. Science Pre-Physical Therapy Emphasis as Part of 1<sup>st</sup> Year of DPT Program</b>		
<b>DPT FALL I</b>		
DPT 5124	Anatomy of Movement I	4
DPT 5134	Applied Physiology I	4
DPT 5152	Health Behavior Science	3
		<b>11</b>
<b>DPT SPRING I</b>		
DPT 5224	Anatomy of Movement II	4
DPT 5234	Applied Physiology II	4
DPT 5254	Applied Neuroscience	4
		<b>12</b>

**DEPARTMENT OF EXERCISE SCIENCE**

The Department of Exercise Science offers the following degree:

- Bachelor of Science  
Major  
Exercise Science

Minors

Athletic Training

The Department of Exercise Science also helps to coordinate the following program:

- Pre-Med Professional Track
- Pre-Physical Therapy Professional Track

**BACHELOR OF SCIENCE — EXERCISE SCIENCE MAJOR 120 HRS.**

	Mathematics	Science	Hum/SS	Communication	Other
<b>General Education 42 hours</b>	MA 113 MA 253	BIO 104	PSY 113 SM 393  HUM electives (6)	ENG 103 ENG 113  SP 203	BIO 254 EXS 102  Gen Ed elective (5)
<b>Content Requirements 56 hours</b>	<b>Program Requirements</b> EXS 103 Teaching Sport Skills I EXS 123 Teaching Sport Skills II EXS 243 Athletic Training SM 253 Risk Management EXS 273 Nutrition SM 313 Principles of Sport and Recreation EXS 332 Drug Education EXS 333 Kinesiology EXS 353 Exercise Physiology EXS 373 Health Problems EXS 383 Nutrition Counseling EXS 402 Exercise Leadership SM 412 Business Planning in Sport and Recreation EXS 433 Developing Health Promotion EXS 451 Pre-capstone Exercise Science EXS 452 Fitness Evaluation Assessments EXS 453 Capstone for Exercise Science EXS 463 Motor Learning EXS 474 Internship EXS 493 Personal Training  UE 101 University Experience				
<b>Add'l 22 hours</b>	<b>Electives to be determined with Advisor (22)</b>				

**TOTAL IN DEGREE PROGRAM:**

**120 HRS.**

## PROFESSIONAL TRACKS

### PRE-MED PROFESSIONAL TRACK 42 HRS

The Pre-Physical Therapy Professional Track can be associated with any major offered at Trine University, though majors in the Science Department 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

<b>Pre-Med Professional Track Requirements 42 hours</b>	<b>Pre-Med Professional Track Requirements (42)</b> Biological Sciences (8) CH 104 General Chemistry I CH 114 General Chemistry II CH 203 Organic Chemistry I CH 211 Organic Chemistry I Lab CH 213 Organic Chemistry II CH 221 Organic Chemistry II Lab CH 434 Biochemistry  PH 154 College Physics I and PH 164 College Physics II or PH 224 University Physics I and PH 234 University Physics II  PS Y 113 Principles in Psychology  SOC 103 Sociology
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Track requires coursework in the following areas:

### TOTAL IN PRE-MED PROFESSIONAL TRACK

**42 HRS**

Pre-Med Professional Track is designed for students interested in preparing themselves for a career in the health sciences and can be associated with any major offered at Trine

**Also**, students must maintain a cumulative GPA of 3.5 or better to stay in the track. They are evaluated during their senior years via benchmark interviews that address the following characteristics of a successful medical school applicant: MCAT preparation; development of personal and professional qualities; medical or graduate school applications; portfolio comprehensiveness; and community service, research, and leadership experiences.

**PRE-PHYSICAL THERAPY PROFESSIONAL TRACK**

**41 HRS.**

**Requirements for the Track**

The Pre-Physical Therapy Professional Track can be associated with any major offered at Trine University, though majors in the Science Department 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 coursework in the following area:

<b>Pre-Med Professional Track Requirements 41 hours</b>	<p><b>Pre-Physical Therapy Professional Track Requirements (41)</b></p> <p>Biological Sciences –(excluding botany and zoology) (8)</p> <p>BIO 254 Human Anatomy</p> <p>BIO 354 Human Physiology</p> <p>CH 104 General Chemistry I</p> <p>CH 114 General Chemistry II</p> <p>ENG 453 Advanced Composition</p> <p>MA 253 Statistics</p> <p>PH 154 College Physics I and PH 164 College Physics II or PH 224 University Physics I and PH 234 University Physics II</p> <p>Psychology Elective (3)</p>
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**PRE-PHYSICAL THERAPY PROFESSIONAL TRACK**

**41 HRS.**

**Also**, students must maintain a cumulative GPA of 3.5 or better to stay in the track. They are evaluated 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.

## **SCHOOL OF PROFESSIONAL STUDIES**

\*\*\*Trine University is seeking accreditation from Accreditation Council for Business Schools and Programs (ACBSP), [www.acbsp.org](http://www.acbsp.org), for all business programs offered through the School of Professional Studies.

### **CLASS SCHEDULING**

Geared to the working adult, most classes convene one night per week during an eight-week term of a 16-week semester. 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**

SPS 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 SPS 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 at [trine.edu/lis](http://trine.edu/lis). 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 course work offered by the military as recommended by the American Council on Education in its Guide to the Evaluation of

## Trine University

Educational Experiences in the Armed Services. Credits are awarded subject to the approval of the Office of the Registrar.

### **SCHOOL OF PROFESSIONAL STUDIES DEGREE PROGRAMS**

\*\*\*Trine University is seeking accreditation from Accreditation Council for Business Schools and Programs (1HACBSP), [www.acbsp.org](http://www.acbsp.org), for all business programs through the School of Professional Studies.

Trine University's School of Professional Studies academic degrees include:

#### **GRADUATE DEGREE PROGRAMS (SEE PAGE 65 FOR PROGRAM DETAILS)**

##### **MASTER OF SCIENCE WITH A MAJOR IN CRIMINAL JUSTICE WITH CONCENTRATIONS AND CERTIFICATES IN:**

- EMERGENCY MANAGEMENT
- FORENSIC PSYCHOLOGY
- LAW
- PUBLIC ADMINISTRATION

##### **LOU HOLTZ MASTER OF SCIENCE IN LEADERSHIP WITH CONCENTRATIONS IN:**

- BIOMEDICAL REGULATORY AFFAIRS
- BUSINESS ADMINISTRATION
- HEALTHCARE SYSTEMS STUDIES
- HUMAN RESOURCE MANAGEMENT
- INSTRUCTIONAL LEADERSHIP - HIGHER EDUCATION
- INTERNATIONAL STUDIES
- NONPROFIT ORGANIZATIONAL STUDIES
- SPORT MANAGEMENT
- STRATEGIC FORESIGHT & ENTREPRENEURSHIP
- SUSTAINABLE AND ENVIRONMENTAL MANAGEMENT

### **SPS UNDERGRADUATE DEGREE PROGRAMS**

#### **BACHELOR OF ENGINEERING**

- WITH A MAJOR IN BIOMEDICAL ENGINEERING MANAGEMENT
- WITH A MAJOR IN CIVIL ENGINEERING MANAGEMENT
- WITH A MAJOR IN MECHANICAL ENGINEERING MANAGEMENT

#### **BACHELOR OF SCIENCE IN DESIGN ENGINEERING TECHNOLOGY**

#### **BACHELOR OF ARTS WITH A MAJOR IN COMMUNICATIONS WITH TRACKS IN:**

- PUBLIC RELATIONS – PR
- NEW MEDIA STUDIES – NMS

**Trine University**

BACHELOR OF SCIENCE WITH A MAJOR IN CRIMINAL JUSTICE

BACHELOR OF SCIENCE WITH A MAJOR IN PSYCHOLOGY

\*\*\*BACHELOR OF APPLIED MANAGEMENT

\*\*\*BACHELOR OF SCIENCE IN BUSINESS ADMINISTRATION

MAJORS IN:

- ACCOUNTING
- HEALTHCARE MANAGEMENT
- HUMAN RESOURCE MANAGEMENT
- MANAGEMENT

**ASSOCIATE DEGREE PROGRAMS**

- ASSOCIATE OF SCIENCE IN ENGINEERING TECHNOLOGY
- \*\*\*ASSOCIATE IN ACCOUNTING
- \*\*\*ASSOCIATE IN BUSINESS ADMINISTRATION

**School of Professional Studies Mission**

Our mission is to provide quality, continuous higher learning opportunities for adults who want to begin or advance in careers, enhance lifelong learning, and keep pace with the growing complexities of today's world.

## SPS UNDERGRADUATE DEGREE PROGRAM REQUIREMENTS

### SPS BACHELOR OF ENGINEERING

### BIOMEDICAL ENGINEERING MANAGEMENT MAJOR

**127 HRS.**

	Mathematics	Science	Hum/SS	Communication	Other
<b>General Education</b> 42 hours	MA 134 MA 213	BIO 104	ECO 213 ECO 223 HUM elective (3) HUM elective (3)	ENG 103 ENG 133 SP 203	Gen Ed elec (3) MA 164 MA 233
<b>Core Requirements</b> 53 hours	<p><b><u>Engineering Science Core (23)</u></b>                      ES 213 Statistics                      ES 223 Dynamics                      ES 233 Engineering Materials                      ES 243 Solid Mechanics                      ES 253 Electrical Science                      ES 313 Thermodynamics                      ES 323 Fluid Mechanics                      ES 382 Engineering Economics</p> <p><b><u>Biomechanical Engineering Stem (21)</u></b>                      BME 313 BIOMED Material                      BME 323 BIOMED Kinematics                      BME 333 BIOMED Electricity                      BME 403 BIOMED Imaging and Measurement Systems                      BME 423 BIOMED Human Mechanics                      BME 463 BIOMED Design Fundamentals                      GE 403 Engineering Project</p> <p><b><u>Business Management Core (9)</u></b>                      MGT 323 Leadership                      MGT 353 Designing Operations                      LAW 203 Business Law I</p>				

<b>Other Program Requirements</b> 32 hours	UE 111 Adult Learning Orientation Degree-related electives (2) Degree-related electives (3) PH 224 University Physics I PH 234 University Physics II MA 393 Probability and Statistics MA Elective (200 or higher) (3) BIO 244 Human Anatomy I BIO 254 Human Anatomy II CH 104 General Chemistry
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**TOTAL IN DEGREE PROGRAM: 127 HR**

**SPS BACHELOR OF ENGINEERING**

**CIVIL ENGINEERING MANAGEMENT MAJOR**

**126 HRS.**

	Mathematics	Science	Hum/SS	Communication	Other
<b>General Education</b> 42 hours	MA 134 MA 213	CH 104	ECO 213 ECO 223 HUM elective (3) HUM elective (3)	ENG 103 ENG 133 SP 203	Gen Ed elec (3) MA 164 MA 233
<b>Core Requirements</b> 60 hours	<p><b><u>Engineering Science Core (23)</u></b>                      ES 213 Statistics                      ES 223 Dynamics                      ES 233 Engineering Materials                      ES 243 Solid Mechanics                      ES 253 Electrical Science                      ES 313 Thermodynamics                      ES 323 Fluid Mechanics                      ES 382 Engineering Economics</p> <p><b><u>Civil Engineering Stem (19)</u></b>                      EGR 153 Civil Engineering Graphics                      CE 3201 Civil Engineering Materials Lab                      CE 3203 Civil Engineering Materials                      CE 3503 Structural Analysis                      CE 3523 Introduction to Structural Design                      CE 4523 Advanced Structural Design                      GE 403 Engineering Project</p> <p><b><u>Business Management Core (18)</u></b>                      MGT 323 Leadership                      MGT 353 Designing Operations                      LAW 203 Business Law I                      BA/MGT elective (3)                      BA/MGT elective (3)                      BA/MGT elective (3)</p>				

<b>Other Program Requirements</b> 24 hours	UE 111 Adult Learning Orientation Degree-related electives (3) Degree-related electives (3) Degree-related electives (3) PH 224 University Physics I PH 234 University Physics II MA 393 Probability and Statistics MA Elective (200 or higher) (3)
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**TOTAL IN DEGREE PROGRAM: 126 HRS.**

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**SPS BACHELOR OF ENGINEERING**

**MECHANICAL ENGINEERING MANAGEMENT MAJOR**

**126 HRS.**

	Mathematics	Science	Hum/SS	Communication	Other
<b>General Education</b> 42 hours	MA 134 MA 213	CH 104	ECO 213 ECO 223 HUM elective (3) HUM elective (3)	ENG 103 ENG 133 SP 203	Gen Ed elec (3) MA 164 MA 233
<b>Core Requirements</b> 59 hours	<p><b><u>Engineering Science Core (23)</u></b>                      ES 213 Statistics                      ES 223 Dynamics                      ES 233 Engineering Materials                      ES 243 Solid Mechanics                      ES 253 Electrical Science                      ES 313 Thermodynamics                      ES 323 Fluid Mechanics                      ES 382 Engineering Economics</p> <p><b><u>Mechanical Engineering Stem (18)</u></b>                      EGR 143 Engineering Graphics                      MAE 303 Mechanics of Machinery                      MAE 343 Manufacturing Process and Equipment                      MAE 353 Computer-Aided Machine Design                      MAE 463 Measurement Laboratory                      GE 403 Engineering Project</p> <p><b><u>Business Management Core (18)</u></b>                      MGT 323 Leadership                      MGT 353 Designing Operations                      LAW 203 Business Law I                      BA/MGT elective (3)                      BA/MGT elective (3)                      BA/MGT elective (3)</p>				

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<b>Other Program Requirements</b> 25hours	UE 111 Adult Learning Orientation Degree-related electives (3) Degree-related electives (3) Degree-related electives (4) PH 224 University Physics I PH 234 University Physics II MA 393 Probability and Statistics MA Elective (200 or higher) (3)
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**TOTAL IN DEGREE PROGRAM: 126 HR**

**SPS BACHELOR OF SCIENCE WITH A MAJOR IN:  
DESIGN ENGINEERING TECHNOLOGY**

**121 HRS.**

	Mathematics	Science	Hum/SS	Communication	Other
<b>General Education</b> 42 hours	MA 113 MA 123 MA 134 MA 253	PH 154 PH 164	PSY 113 ECO 213 ECO 223 HUM Elective (3)	ENG 103 ENG 133 SP 203	
<b>Add'l hrs</b> 7		CH 144	ECO 233		

<b>Core Requirements</b> 72 hours	<p><b>Design Engineering Technology : 46 hours</b></p> <p>ETD 101 Introduction to Engineering Technology OR UE 111 Adult Learning Orientation</p> <p>ETD 103 Basic Technical Drawing ETD 113 Geometric Dimensioning &amp; Tolerancing ETD 123 Manufacturing Materials &amp; Processes ETD 163 Environmental Health &amp; Safety ETD 173 Computer-Aided 3D Modeling ETD 203 Basic Mechanisms ETD 233 Engineering &amp; Manufacturing Systems ETD 263 Design, Analysis, &amp; Prototyping ETD 273 Electrical Fundamentals ETD 313 Design for Manufacture and Assembly ETD 333 Statics &amp; Strength of Materials ETD 363 Elements of Machines ETD 433 Computer Numerical Control ETD 463 Senior Design Project I ETD 473 Senior Design Project II</p> <p><b>Additional Requirements: 18 hours</b></p> <p>COM 213 Business Communication EGR 453 Advanced Parametric Design INF 103 Information Applications MGT 353 Designing Operations MGT 363 Organizational Behavior MGT 413 Management of Quality</p> <p><b>Free Electives: 8 hours</b></p> <p>Department Approved Elective (2 hrs min) 300/400 Department Approved Elective 300/400 Department Approved Elective</p>
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**TOTAL IN DEGREE PROGRAM:**

**121 HRS.**

**SPS - BACHELOR OF ARTS—COMMUNICATION MAJOR**

**120 HRS.**

	Mathematics	Science	Hum/SS	Communication	Other
<b>General Education</b> 42 hours	MA 113 Or MA 153 Math Elective (3)	Science Elective (4)	COM 233 Literature course (3) PSY 113 SS elective (3)	ENG 103 ENG 113  SP 203	COM 123 COM 163 COM 203 General Ed Elective (3)
<b>Add'l</b> 30					UE 111 Free electives (29)

<b>Content Requirements</b> 27 hours	<p><b>Communication Core</b></p> <p>COM 111 Communication Practices and Professions          COM 153 Principles of Public Relations          COM 213 Business Communication          COM 253 Event Planning and Promotion          COM 263 Theories and Research in Communication          COM 293 Argumentation and Debate          COM 301 Media Practicum <b>(taken twice) (2)</b>          COM 363 Rhetoric and Persuasion          COM 433 Media Law and Ethics          COM 4013 Senior Capstone Internship  <b>or</b>          COM 4281 Senior Communication Proposal  <b>and</b>          COM 4292 Senior Communication Project</p>
<b>Tracks</b> 21 hours	<p><b>Choose One Track Listed Below:</b></p> <p><b>Public Relations and Corporate Communication Track</b></p> <p>COM 353 Public Relations Writing and Production          COM 413 Corporate and Organizational Communication          COM 453 Public Relations Planning and Campaigns          MK 323 Integrated Marketing Communications          MK 463 Marketing Research          Communication electives (selected in consultation with advisor) (6)</p> <p><b>New Media Production Track</b></p> <p>COM 183 Writing for Media          COM 243 Digital Media Creation          COM 343 Web Content Management          COM 383 Feature Reporting          COM 483 Public Affairs Reporting          FLM 203 Film Appreciation          Communication electives (selected in consultation with advisor) (3)</p>

**TOTAL IN DEGREE PROGRAM:**

**120 HRS.**

**SPS - BACHELOR OF SCIENCE – CRIMINAL JUSTICE MAJOR**

**120 HRS.**

	Mathematics	Science	Hum/SS	Communication	Other
<b>General Education</b> 42 hours	MA 113 <b>or</b> MA 153 <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 5px auto;">Math or Science Elective (3)</div>	BIO 103 SCI elective (3)	ENG 153 ECO 213 <b>or</b> ECO 223  HIS 103 <b>or</b> HIS 203  HIS 113 <b>or</b> HIS 213	ENG 103 ENG 113  SP 203 <b>or</b> COM 163	SOC 103 <b>or</b> PSY 113  GOV 113 INF 103

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<b>Content Requirements</b> 63 hours	UE 111 Adult Learning Orientation GOV 333 State and Local Government GOV 403 American Constitutional Development LE 103 Introduction to Criminal Justice LE 153 Juvenile Justice LE 253 Probation, Parole, and Community Corrections LE 263 Introduction to Criminal Law and Justice LE 273 Criminal Procedures and Evidence LE 343 Criminalistics and Crime Scene Investigations I LE 473 Law Enforcement Internship PSY 383 Forensic Psychology <b>Electives (32)</b> - Electives are determined in conjunction with an advisor and based on student career objectives.
<b>Concentrations</b> 15 hours	<b>Select one of the following concentrations. (15 Hours)</b> <u><b>Option A – Emergency Management (15)</b></u> EM 103 Introduction to Emergency Management EM 223 Risk Management EM 383 Preparedness & Responses Operations EM 403 Managing Consequences of Terrorism EM Elective (3) <u><b>Option B – Management Leadership (15)</b></u> COM 213 Business Communication MGT 313 HR Management MGT 323 Leadership MGT 333 Supervision MGT 363 Organizational Behavior <u><b>Option C – Psychology (15)</b></u> PSY 323 Abnormal Psychology PSY 333 Psychology of Personality PSY 343 Social Psychology PSY 353 Child and Adolescent Psychology PSY 423 Counseling Theories and Practices <u><b>Option D – Academy Training/Professional Training (15)</b></u> Can be filled by documented Academy, Fire, Police, EMT or Military Training and/or Prior Learning.

**TOTAL IN DEGREE PROGRAM: 120 HRS.**

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**SPS- BACHELOR OF SCIENCE – PSYCHOLOGY MAJOR 120 HRS.**

Mathematics	Science	Hum/SS	Communication	Other
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**Trine University**

<b>General Education</b> 42hours	{	Take MA 113 or MA 153 and BIO 103 plus a Math or Science elective to total 10 credit hours	Hum elective (3) Hum elective (3)	ENG 103 ENG 113	INF 103												
			GOV 113  ECO 213 <i>or</i> ECO 223	SP 203 <i>or</i> COM 163	HIS 103 <i>or</i> HIS 203  HIS 113 <i>or</i> HIS 213 Gen Ed Elective (2)												
<b>Program Requirements</b> 36 hours	<p><b>Electives: 35 hours</b></p> <p>Students wishing to pursue graduate training in psychology should take: MA 113 College Algebra and MA 253 Statistics within these electives.</p>																
<b>Content Requirements</b> 42 hrs.	<p><b>Primary Core</b></p> <p>Choose 18 hours from any 300 level or higher psychology courses or SOC 313, SOC 323, SOC 343, excluding subject area concentration courses chosen below. (6 X 3 credits)</p> <p><b>Required:</b></p> <table style="width: 100%; border: none;"> <tr> <td>PSY 113 Principles of Psychology</td> <td style="text-align: right;">1 _____</td> </tr> <tr> <td>PSY 303 Research Methods in Psychology</td> <td style="text-align: right;">2 _____</td> </tr> <tr> <td>PSY 453 Clinical Internship</td> <td style="text-align: right;">3 _____</td> </tr> <tr> <td><b>Or</b></td> <td style="text-align: right;">4 _____</td> </tr> <tr> <td>PSY 473 Psychology Capstone Demonstration</td> <td style="text-align: right;">5 _____</td> </tr> <tr> <td></td> <td style="text-align: right;">6 _____</td> </tr> </table> <p><b>Choose two of the following clinical courses:</b></p> <p>PSY 323 Abnormal Psychology PSY 403 Human Sexuality PSY 413 The Psychology of Addiction PSY 423 Counseling Theories and Practices</p> <p><b>Choose two of the following social core courses:</b></p> <p>PSY 333 Psychology of Personality PSY 343 Social Psychology PSY 373 Political Psychology PSY 313 Topics in Psychology Or SOC 313 Topics in Sociology</p> <p><b>Choose one of the following developmental core courses:</b> (If more than one, place others above)</p> <p>PSY 353 Child and Adolescent Psychology SOC 323 The Family</p>					PSY 113 Principles of Psychology	1 _____	PSY 303 Research Methods in Psychology	2 _____	PSY 453 Clinical Internship	3 _____	<b>Or</b>	4 _____	PSY 473 Psychology Capstone Demonstration	5 _____		6 _____
PSY 113 Principles of Psychology	1 _____																
PSY 303 Research Methods in Psychology	2 _____																
PSY 453 Clinical Internship	3 _____																
<b>Or</b>	4 _____																
PSY 473 Psychology Capstone Demonstration	5 _____																
	6 _____																

**TOTAL IN DEGREE PROGRAM:**

**120 HRS.**

**\*\*\*BACHELOR OF APPLIED MANAGEMENT**

## Trine University

The Bachelor of 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.

### **Program Goal:**

The goal is to equip students with the quality educational tools needed to develop a career of leadership in the Applied Management profession, provide them with a depth of studies that prepares them to meet the contemporary needs of the business and community they will serve as professionals, and to enable them to be contributing citizens of local, regional and international communities with a valuable and diverse knowledge.

### **Program Objectives**

**Objective #1:** Students will be able to seek professional career paths.

**Objective #2:** Students will be able to use basic core of management skills.

**Objective #3:** Students will be able to have a basic understanding of general education skills to encourage lifelong learning and career advancement.

**Objective #4:** Students will be able to have a knowledge base specific to management.

### **TECHNICAL SPECIALTY**

Students completing the Bachelor of Applied Management degree program must complete a minimum of 28 semester hours in a business or technical field acquired through occupational, technical training or classroom instruction. As many as 17 additional semester hours in a technical specialty may count as electives.

In the degree program descriptions that follow, an asterisk (\*) indicates that those courses satisfy the University's general education requirements.

\*\*\*Trine University is seeking accreditation from Accreditation Council for Business Schools and Programs (1HACBSP), [www.acbsp.org](http://www.acbsp.org), for all business programs through the School of Professional Studies

**SPS - \*\*\*BACHELOR OF APPLIED MANAGEMENT MAJOR 120 HRS.**

	Mathematics	Science	Hum/SS	Communication	Other
General Education 42 hours	MA 113 MA 173	SCI elective (3) Math/Science Elective (1)	SS Elective (3) SS Elective (3) Humanities elective (3) Humanities elective (3)	ENG 103 ENG 113  SP 203 OR COM 163	Gen Ed electives (11)
Additional Requirements 23 hours	ECO 213 Microeconomics (3) ECO 223 Macroeconomics (3) UE 111 (1) Electives (16)				
Technical Specialty Area 28 Hrs.	Technical Specialty (28)				
Program Requirements 27 Hours	<u>Business Core</u> AC 203 Accounting I (3) AC 213 Accounting II (3) BA 343 International Business (3) FIN 303 Managerial Finance (3) LAW 203 Business Law I (3) MGT 353 Designing Operations (3) MGT 363 Organizational Behavior (3) MGT 453 Strategic Management (3) MK 203 Marketing (3)				

**TOTAL IN DEGREE PROGRAM:**

**120 HRS.**

**Trine University**

\*\*\*Trine University is seeking accreditation from Accreditation Council for Business Schools and Programs (1HACBSP), [www.acbsp.org](http://www.acbsp.org), for all business programs through the School of Professional Studies.

**SPS \*\*\*BACHELOR OF SCIENCE IN BUSINESS ADMINISTRATION**

**ACCOUNTING MAJOR**

**120 HRS.**

	<b>Mathematics (9 hrs.)</b>	<b>Science (3 or 4 hrs.)</b>	<b>Hum/SS (12 hrs.)</b>	<b>Communication (9 hrs.)</b>	<b>Other (8 or 9 hrs.)</b>
<b>General Education 42 hours</b>	MA 113 MA 173 MA 253	SCI elective w/out lab (3) with lab (4)	ECO 213 ECO 223 HUM elective (3) Foreign Language (3)	ENG 103 ENG 113 SP 203	PSY 113 BA 113 Gen Ed elective (2 or 3) <small>(If 3 hrs. of Science chosen need to choose 3 hr. elective here)</small>
<b>Additional Requirements 14 hours</b>	BA 101 University Experience (Main Campus students) Or UE 111 Adult Learning Orientation (SPS students) BA 123 Business Concepts BA 213 Advance Spreadsheet for Business BA 301 Professional Development and Strategies COM 213 Business Communication Any four (4) hour elective(s)				
<b>Program Requirements 63 hours</b>	<p><b><u>Business Core (30 hrs.)</u></b>                      AC 203 Accounting I                      AC 213 Accounting II                      BA 343 International Business                      FIN 303 Managerial Finance                      LAW 203 Business Law I                      MGT 353 Designing Operations                      MGT 363 Organizational Behavior                      MGT 453 Strategic Management                      MK 203 Marketing                      MGT 473 CAPSIM Business Simulation                      Or                      BA 3113 Business Internship (Advisor will determine the appropriate class)</p> <p><b><u>Concentration Requirements (33 hrs.)</u></b>                      AC 303 Cost Accounting                      AC 323 Intermediate Accounting I                      AC 333 Intermediate Accounting II                      AC 373 Accounting information Systems                      AC 403 Advanced Accounting                      AC 423 Income Tax                      AC 463 Auditing                      FIN 413 Corporate Finance                      Business Electives - 6 hrs. (300-400 level from AC or FIN)                      Business Elective -3 hrs. (any business elective in the 300 or 400 level)</p>				

**TOTAL IN PROGRAM**

**120 HRS.**

**Trine University**

\*\*\*Trine University is seeking accreditation from Accreditation Council for Business Schools and Programs (1HACBSP), [www.acbsp.org](http://www.acbsp.org), for all business programs through the School of Professional Studies.

**SPS \*\*\*BACHELOR OF SCIENCE IN BUSINESS ADMINISTRATION**

**HEALTHCARE MANAGEMENT MAJOR**

**120 HRS.**

	<b>Mathematics (9)</b>	<b>Science (3-4 hrs.)</b>	<b>Hum/SS (12)</b>	<b>Communication (9)</b>	<b>Other (8 – 9 hrs.)</b>
<b>General Education 42 hours</b>	MA 113 MA 173 MA 253	SCI elective w/out lab (3) with lab (4)	ECO 213 ECO 223 HUM elective (3) Foreign Language (3)	ENG 103 ENG 113  SP 203	PSY 113 BA 113 Gen Ed elective (2 or 3) <small>(If 3 hrs. of Science chosen need to choose 3 hr. elective here)</small>
<b>Additional Requirements 15 hours</b>	BA 101 University Experience (Main Campus) or UE 111 Adult Learning Orientation (SPS Students) BA 301 Professional Development and Strategies BA 123 Business Concepts BA 213 Advance Spreadsheet for Business COM 213 Business Communication Electives (4)				
<b>Program Requirements 30 hours</b>	<b><u>Business Core (30 hrs)</u></b> AC 203 Accounting I AC 213 Accounting II BA 343 International Business FIN 303 Managerial Finance Honors LAW 203 Business Law I MGT 353 Design Operations MGT 363 Organizational Behavior MGT 453 Strategic Management MK 203 Marketing MGT 473 CAPSIM Business Simulation Or BA 3113 Business Internship (Advisor will determine the appropriate class)				
<b>Major Requirements 33 hours</b>	<b><u>Healthcare (33 hrs)</u></b> BA 403 Business and Public Policy HC 333 Management Techniques and Principles HC 443 Health Care Delivery Systems HC 413 Health Care Accounting HC 423 Health Care Finance HC 483 Program and Fitness Management HR 403 Project Management MGT 313 Human Resource Management MGT 323 Leadership MGT 413 Management of Quality MGT 443 Managing Operations				

**TOTAL IN DEGREE PROGRAM:**

**120 HRS.**

**Trine University**

\*\*\*Trine University is seeking accreditation from Accreditation Council for Business Schools and Programs (1HACBSP), [www.acbsp.org](http://www.acbsp.org), for all business programs through the School of Professional Studies.

**SPS \*\*\*BACHELOR OF SCIENCE IN BUSINESS ADMINISTRATION**

**HUMAN RESOURCE MANAGEMENT**

**120 HRS.**

	<b>Mathematics (9)</b>	<b>Science (3)</b>	<b>Hum/SS (12)</b>	<b>Communication (9)</b>	<b>Other (9)</b>
<b>General Education 42 hours</b>	MA 113 MA 173 MA 253	SCI elective (3)	ECO 213 ECO 223 Foreign Language (3) Humanities Electives (3)	ENG 103 ENG 113  SP 203	PSY 113 BA 113  Gen Ed electives (3)
<b>Additional Requirements 15 hours</b>	UE 111 Adult Learning Orientation BA 123 Business Concepts BA 213 Advanced Spreadsheets for Business BA 301 Professional Development & Strategies COM 213 Business Communication Elective (4)				
<b>Program Requirements 63 hours</b>	<p><b><u>Business Core (30 Hrs.)</u></b></p> AC 203 Accounting I AC 213 Accounting II BA 343 International Business FIN 303 Managerial Finance Honors LAW 203 Business Law I MGT 353 Design Operations MGT 363 Organizational Behavior MGT 453 Strategic Management MK 203 Marketing MGT 473 CAPSIM Business Simulation Or BA 3113 Business Internship (Advisor will determine the appropriate class) <p><b><u>Concentration Requirements (33 Hrs.)</u></b></p> FIN 403 Investments HR 303 Compensation and Benefits HR 313 Training and Development HR 323 Safety and Health Management HR 403 Project Management LAW 403 Employment Law MGT 313 Human Resource Management MGT 323 Leadership PSY 363 Counseling 300 or 400 level Business or Management Elective (6)				

**TOTAL IN DEGREE PROGRAM:**

**120 HRS.**

**Trine University**

\*\*\*Trine University is seeking accreditation from Accreditation Council for Business Schools and Programs (1HACBSP), [www.acbsp.org](http://www.acbsp.org), for all business programs through the School of Professional Studies.

**SPS \*\*\*BACHELOR OF SCIENCE IN BUSINESS ADMINISTRATION  
MANAGEMENT MAJOR**

**120 HRS.**

	Mathematics	Science	Hum/SS	Communication	Other
<b>General Education 42 hours</b>	MA 113 MA 173 MA 253	SCI elective w/out lab (3) with lab (4)	ECO 213 ECO 223 HUM elective (3) Foreign Language (3)	ENG 103 ENG 113  SP 203	PSY 113 BA 113 Gen Ed elective (2 or 3) (If 3 hrs. of Science chosen need to choose 3 hr. elective here)
<b>Additional Requirements 15 hours</b>	BA 101 University Experience Or UE 111 Adult Learning Orientation BA 123 Business Concepts BA 213 Advance Spreadsheet for Business BA 301 Professional Development and Strategies COM 213 Business Communication Electives (4)				
<b>Program Requirements 63 hours</b>	<p><b><u>Business Core</u></b></p> AC 203 Accounting I AC 213 Accounting II BA 343 International Business FIN 303 Managerial Finance Honors LAW 203 Business Law I MGT 353 Design Operations MGT 363 Organizational Behavior MGT 453 Strategic Management MK 203 Marketing MGT 473 CAPSIM Business Simulation Or BA 3113 Business Internship (Advisor will determine the appropriate class) <p><b><u>Concentration Requirements</u></b></p> BA 403 Business and Public Policy ENT 303 Entrepreneurial Leadership or MGT 323 Leadership MGT 313 Human Resource Management MGT 343 Human Resource Development MGT 413 Management of Quality MGT 443 Managing Operations MK 363 Buyer Behavior MK 423 Personal Selling Management elective (3) Business electives ( 300/400 level from AC, BA, ENT, FIN, LAW, MGT, MK) (6)				

**TOTAL IN DEGREE PROGRAM:**

**120 HRS.**

## ASSOCIATE OF SCIENCE IN ENGINEERING TECHNOLOGY

Associate of Science in Engineering Technology degree program prepares graduates with the applied problem solving knowledge and hands-on skills to enter into careers as Engineering Technicians. The focus for this career will be in the design, manufacturing, testing, technical sales or maintenance industries and satisfies an industry demand for engineering technicians. Graduates of the associate degree program will typically have skill levels that will allow for specifying, testing, documenting, operating, selling or maintenance of engineering systems.

### Program Goal:

The goal is to offer students a scientific and mathematical foundation along with applied skills to fulfill the competencies needed for Engineering technician's career.

### Program Objectives:

**Objective #1:** Graduates will demonstrate competency in applying mathematical, scientific and creative problem solving aspects to engineering technology projects.

**Objective #2:** Graduates will effectively communicate technical information in both written and oral form.

**Objective #3:** Graduates will be prepared to pursue a lifetime of self-directed learning and professional development.

**Objective #4:** Graduates will apply their practical education, analytical reasoning and creative skills toward resolution of issues that are scientific, technological and social.

## SPS - ASSOCIATE OF SCIENCE IN ENGINEERING TECHNOLOGY 66 HRS.

	Mathematics (3 hrs.)	Science (4 hrs.)	Hum/SS (6 hrs.)	Communication (6 hrs.)	Other (3 hrs)
General Education 22 hours	MA 113	CH 144	SS Elective (3) HUM elective (3)	ENG 103 COM 163 Or SP 203	INF 103
Additional Requirements 11 hours	ENG 133 Technical Communication MA 123 Trigonometry PH 154 College Physics I UE 111 Adult Learning Orientation				
Program Requirements 33 hours	ETD 103 Basic Technical Drawing ETD 113 Geometric Dimensioning and Tolerancing ETD 123 Manufacturing Materials and Manufacturing Processes ETD 163 Environmental Health and Safety ETD 173 Computer Aided 3-D Modeling ETD 203 Basic Mechanisms ETD 233 Engineering and Manufacturing Systems ETD 333 Statics and Strength of Materials ETD 263 Design, Analysis and Prototyping ETD 273 Electrical Fundamentals ETD 293 Introduction to CNC				

## ASSOCIATE OF SCIENCE IN ENGINEERING TECHNOLOGY 66HRS.

**\*\*\*SPS ASSOCIATE OF SCIENCE IN ACCOUNTING 60 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 Catalog 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.

**SPS - ASSOCIATE OF SCIENCE IN ACCOUNTING 60 HRS.**

	<b>Mathematics (3/4 hrs.)</b>	<b>Science (3/4hrs.)</b>	<b>Hum/SS (6 hrs.)</b>	<b>Communication (6 hrs.)</b>	<b>Other (3 hrs)</b>
<b>General Education 22 hours</b>	MA 113 Math or Science elective (1)	SCI elective (3) Science or Math Elective (1)	HUM elective (3) ECO 213 Or ECO 223	ENG 103 ENG 113	SP 203
<b>Additional Requirements 8 hours</b>	BA 101 University Experience (Main Campus students) Or UE 111 Adult Learning Orientation (SPS students) BA 301 Professional Development & Strategies <i>Select two of the following courses (6 hrs)</i> BA 113 Business Applications And/Or COM 213 Business Communication And/Or PSY 113 Psychology				
<b>Program Requirements 30 hours</b>	<u><b>Associate Business Core 15 hrs.</b></u> AC 203 Accounting I AC 213 Accounting II BA 123 Business Concepts LAW 203 Business Law I MK 203 Marketing  <u><b>Concentration Requirements 15 hrs.</b></u> AC 303 Cost Accounting AC 323 Intermediate Accounting I AC 333 Intermediate Accounting II AC 373 Accounting information Systems AC 423 Personal Income Tax Or AC 463 Auditing				

**ASSOCIATE OF SCIENCE IN ACCOUNTING**

**60 HRS.**

**Trine University**

\*\*\*Trine University is seeking accreditation from Accreditation Council for Business Schools and Programs (1HACBSP), [www.acbsp.org](http://www.acbsp.org), for all business programs through the School of Professional Studies.

**SPS - \*\*\*ASSOCIATE OF SCIENCE IN BUSINESS ADMINISTRATION 60 HRS.**

	<b>Mathematics (3/4 hrs.)</b>	<b>Science (3/4 hrs.)</b>	<b>Hum/SS (6 hrs.)</b>	<b>Communication (6 hrs.)</b>	<b>Other (3 hrs.)</b>
<b>General Education 22 hours</b>	MA 113 Math or Science elective (1)	SCI elective (3) Science or Math Elective (1)	ECO 213 OR ECO 223 HUM elective (3)	ENG 103 ENG 113	SP 203
<b>Additional Requirements 8 hours</b>	BA 101 University Experience (Main Campus students) Or UE 111 Adult Learning Orientation (SPS students)  BA 301 Professional Development & Strategies  <i>Select two of the following courses (6 hrs)</i> BA 113 Business Applications And/Or COM 213 Business Communication And/Or PSY 113 Psychology				
<b>Program Requirements 30 hours</b>	<u><b>Business Core (15 hrs.)</b></u> AC 203 Accounting I AC 213 Accounting II BA 123 Business Concepts LAW 203 Business Law I MK 203 Marketing  <u><b>Business Concentration (15 hrs.)</b></u> MGT 363 Organizational Behavior Electives (12 hrs.) - (prefixed AC, BA, INF, ECO, FIN, LAW, MGT, MK)				

**ASSOCIATE OF SCIENCE IN BUSINESS ADMINISTRATION 60 HRS.**

## **COURSE DESCRIPTIONS**

### KEY TO COURSE PREFIXES

AC	Accounting
ARC	Architecture
ART	Art
AS	Air Science (ROTC)
AST	Astronomy
BA	Business Administration
BIO	Biology
BME	Biomedical Engineering
CE	Civil Engineering
CH	Chemistry
CHE	Chemical Engineering
CHN	Chinese
CO	Cooperative Employment
COM	Communication
COV	Community Volunteer
CRJ	Criminal Justice
CS	Computer Science
DPT	Doctorate of Physical Therapy
EAS	Earth Science
ECE	Electrical & Computer Engineering
ECO	Economics
EDU	Education
EGR	Engineering Graphics
EM	Emergency Management
ENG	English
ENT	Entrepreneurship
ES	Engineering Science
ESL	English as a Second Language
ETD	Design Engineering Technology
EXS	Exercise Science
FIN	Finance
FIT	Fitness
FLM	Film
FPY	Forensic Psychology
FRN	French
FS	Forensic Science
GE	General Engineering
GEO	Geography
GLY	Geology
GM	Golf Management
GS	General Studies
GOV	Government
HC	Healthcare Management
HED	Higher Education
HIS	History

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HNR	Honors Seminar
HOS	Hospitality and Tourism
HPE	Health and Physical Education
HR	Human Resources
HUM	Humanities
INF	Informatics
LAW	Law
LDR	Leadership
LE	Law Enforcement
MA	Mathematics
MAE	Mechanical & Aerospace Engineering
MGT	Management
MK	Marketing
MUS	Music
PET	Plastics Engineering Technology
PH	Physics
PHL	Philosophy
PL	Pre-Legal Studies
PSY	Psychology
RA	Regulatory Affairs
SA	Study Abroad
SC	Science
SM	Sport Management
SOC	Sociology
SP	Speech
SPN	Spanish
UE	University Experience
WS	Women's Studies

### **COURSE NUMBERING SYSTEM**

Course numbers are found at the beginning of the course description immediately following the course prefix.

Courses numbered 000: preparatory, non-credit

Courses numbered 100: freshman-level courses

Courses numbered 200: sophomore-level courses

Courses numbered 300: junior-level courses

Courses numbered 400: senior-level courses

Courses numbered 500: graduate-level courses

Courses numbered 600: graduate-level courses

### **EXAMPLE OF COURSE PREFIX AND NUMBER**

CE 3203: This course prefix and number means that this is a civil engineering junior level course.

**COURSE TITLE**

The course title follows the course prefix and number.

**SERIES OF THREE NUMBERS FOLLOWING THE COURSE TITLE**

First digit: indicates the number of class hours per week.

Second digit: indicates the number of laboratory hours per week.

Third digit: indicates the number of semester hours of credit.

Thus, a course name followed by 3-4-5 indicates three class hours each week, four laboratory hours each week, and five semester hours of credit.

**COURSE LEVEL REQUIREMENTS**

Courses at the 100 level within the student's major may not be taken in the senior year without permission of the department chair of the student's major.

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# ACCOUNTING

## **AC 203 ACCOUNTING I 3-0-3**

This course is 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**

## **AC 213 ACCOUNTING II 3-0-3**

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**

## **AC 303 COST ACCOUNTING 3-0-3**

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**

## **AC 323 INTERMEDIATE ACCOUNTING I 3-0-3**

This course introduces comprehensive accounting theory and practice with emphasis on financial statement preparation and analysis. Current problems of corporate accounting and reporting are thoroughly covered, including cash, inventories, fixed assets, intangible assets, and marketable securities. The course uses computer applications.

**Prerequisite: AC 213**

## **AC 333 INTERMEDIATE ACCOUNTING II 3-0-3**

This is a continuation of Intermediate Accounting I. Areas covered include contingent liabilities, capital structure, leases, revenue recognition, earnings per share, pensions, and income taxes. This course uses computer applications.

**Prerequisite: AC 323**

## **AC 343 INTERMEDIATE ACCOUNTING III 3-0-3**

This is a continuation of Intermediate Accounting II. This course continues in- depth coverage of complex topics such as earning per share, pensions, leasing, accounting for income taxes, accounting changes and full disclosures. The course uses computer applications.

**Prerequisite: AC 333**

**AC 353 TAX AND LEGAL ISSUES FOR SMALL BUSINESS 3-0-3**

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**

**AC 373 ACCOUNTING INFORMATION SYSTEMS 3-0-3**

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: BA 113, FIN 303**

**AC 403 ADVANCED ACCOUNTING 3-0-3**

This course covers specialized topics in accounting including branches, segment reporting, business combinations, consolidated financial statement preparation and accounting for partnerships. This course uses computer applications.

**Prerequisite: AC 333**

**AC 413 GOVERNMENTAL AND NOT-FOR-PROFIT ACCOUNTING 3-0-3**

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**

**AC 423 PERSONAL INCOME TAX 3-0-3**

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**

**AC 433 CORPORATE INCOME TAX 3-0-3**

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**

**AC 463 AUDITING 3-0-3**

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**

**AC 473 CPA TOPICS 3-0-3 (EXTRA FEES APPLY)**

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**

**AC 493 SELECTED TOPICS IN ACCOUNTING 3-0-3**

This course treats specific or current accounting issues and problems in depth.

**Prerequisite: Permission of the instructor**

## **ARCHITECTURE**

**ARC 293 ARCHITECTURE APPRECIATION 3-0-3**

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 253 ART APPRECIATION 3-0-3**

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.

## **AIR SCIENCE (ROTC)**

**AS 100 AIR FORCE LEADERSHIP LABORATORY I (0 HRS.)**

A study on Air Force customs and courtesies, drills and ceremonies. Also includes studying the environment of an Air Force officer and learning about areas of opportunity available to commissioned officers.

**Corequisite: AS 101**

**AS 101 THE FOUNDATIONS OF THE UNITED STATES AIR FORCE I (1 HR.)**

A survey course designed to introduce students to the United States Air Force and Air Force ROTC. Featured topics include: mission of the Air Force, officership and professionalism, military customs and courtesies, Air Force officer opportunities, and an introduction to communication skills.

**AS 110 AIR FORCE LEADERSHIP LABORATORY II (0 HRS.)**

A study on Air Force customs and courtesies, drills and ceremonies. Also includes studying the

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environment of an Air Force officer and learning about areas of opportunity available to commissioned officers.

**Corequisite: AS 111**

### **AS 111 THE FOUNDATIONS OF THE UNITED STATES AIR FORCE II (1 HR.)**

Additional study of the organizational structure of the Air Force, with emphasis on leadership and communication skills.

### **AS 200 AIR FORCE LEADERSHIP LABORATORY III (0 HRS.)**

Further study on Air Force customs and courtesies, drill and ceremonies, and military commands. Also includes additional emphasis on the environment of an Air Force officer and learning about areas of opportunity available to commissioned officers. **Corequisite: AS 201**

### **AS 201 THE EVOLUTION OF USAF AIR AND SPACE POWER I (1 HR.)**

A course designed to examine general aspects of air and space power through a historical perspective. Utilizing the perspective, the course covers a time period from the first balloons and dirigibles through the Korean War and into the Cold War era.

### **AS 210 AIR FORCE LEADERSHIP LABORATORY IV (0 HRS.)**

Further study on Air Force customs and courtesies, drill and ceremonies, and military commands. Also includes additional emphasis on the environment of an Air Force officer and learning about areas of opportunity available to commissioned officers.

**Corequisite: AS 211**

### **AS 211 THE EVOLUTION OF USAF AIR AND SPACE POWER II (1 HR.)**

Further study from the Vietnam War to the space-age global positioning systems of the Persian Gulf War. Effective communication techniques are also emphasized.

### **AS 300 AIR FORCE LEADERSHIP LABORATORY V (0 HRS.)**

Activities classified as leadership and management experiences involving the planning and controlling of military activities of the cadet corps, and the preparation and presentation of briefings and other oral and written communications. Also include interviews, guidance, and information which will increase the understanding, motivation, and performance of other cadets.

**Corequisite: AS 303**

### **AS 303 AIR FORCE LEADERSHIP STUDIES I (3 HRS.)**

A study leadership, management fundamentals, professional knowledge, and communication skills required of an Air Force junior officer. Case studies are used to examine Air Force leadership and management situations as a means of demonstrating and exercising practical application of the concepts being studied.

### **AS 310 AIR FORCE LEADERSHIP LABORATORY VI (0 HRS.)**

Activities classified as leadership and management experiences involving the planning and controlling of military activities of the cadet corps, and the preparation and presentation of briefings and other oral and written communications. Also include interviews, guidance, and information which will increase the understanding, motivation, and performance of other cadets.

**Corequisite: AS 313**

**AS 313 AIR FORCE LEADERSHIP STUDIES II (3 HRS.)**

Further study of Air Force personnel and evaluation systems, leadership ethics and additional communication skills.

**AS 400 AIR FORCE LEADERSHIP LABORATORY VII (0 HRS.)**

Further activities classified as leadership and management experiences. They involve the planning and controlling of military activities of the cadet corps, and the preparation and presentation of briefings and other oral and written communications. Also include interviews, guidance, and information which will increase the understanding, motivation, and performance of other cadets.

**Corequisite: AS 403**

**AS 403 NATIONAL SECURITY AFFAIRS/PREPARATION FOR ACTIVE DUTY I (3 HRS.)**

An examination of the national security process, regional studies, advanced leadership ethics, and Air Force doctrine.

**AS 410 AIR FORCE LEADERSHIP LABORATORY VIII (0 HRS.)**

Further activities classified as leadership and management experiences. They involve the planning and controlling of military activities of the cadet corps, and the preparation and presentation of briefings and other oral and written communications. Also include interviews, guidance, and information which will increase the understanding, motivation, and performance of other cadets. **Corequisite: AS 413**

**AS 413 NATIONAL SECURITY AFFAIRS/PREPARATION FOR ACTIVE DUTY II (3 HRS.)**

An examination of the national security process, regional studies, advanced leadership ethics, and Air Force doctrine.

## **ASTRONOMY**

**AST 201 ASTRONOMY LABORATORY 0-1-1**

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**

**AST 203 ASTRONOMY 3-0-3**

An introduction to the field of astronomy, this course is a study of the planets and the stars and their formation and life cycles. The history of the Milky Way Galaxy and the history of the cosmos are studied, with an emphasis on the solar system and methods of observation and measurement.

## **BUSINESS ADMINISTRATION**

**BA 101 UNIVERSITY EXPERIENCE FOR KETNER SCHOOL OF BUSINESS STUDENTS 1-0-1**

This course offers the resources for success in learning for students new to Trine University. This course will assist students in becoming more efficient learners, understanding self and

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others, and learning personal life skills. This course will present information about Trine University offices and services to familiarize students with resources and procedures.

### **BA 113 BUSINESS COMPUTER APPLICATIONS 3-0-3**

This course emphasizes predominant software packages in word processing, spreadsheets, presentation graphics, database management, and e-mail usage, with an eventual goal of the student gaining certification in those areas.

### **BA 123 BUSINESS CONCEPTS 3-0-3**

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 213 ADVANCED SPREADSHEETS FOR BUSINESS 3-0-3**

Concepts including raw data management, business analysis and reporting. Other concepts include: collaboration and 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 to analyze and communicate business information. **Prerequisite: INF 103 or BA 113**

### **BA 233 BUSINESS CAPSTONE DEMONSTRATION 3 CR**

This capstone course will provide students the opportunity to integrate and synthesize previous course work 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**

### **BA 301 PROFESSIONAL DEVELOPMENT & STRATEGIES 1-0-1**

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.

**Prerequisites: Business major, junior or senior standing or permission of the instructor**

### **BA 313 INSURANCE 3-0-3**

This course includes the fundamental principles and practices as they relate to life, compensation, fire, marine, and automobile insurance.

**Prerequisites: LAW 203, MK 203 or permission of the instructor.**

### **BA 323 REAL ESTATE 3-0-3**

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 303, MK 203, or permission of the instructor**

**BA 333 SOCIAL MEDIA FOR BUSINESS 3-0-3**

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**

**BA 343 INTERNATIONAL BUSINESS 3-0-3**

This course discusses economic principles of trade as applied to international business, world international trade environment and trends, world geography and culture as it impacts international trade, knowledge of the operation of importing and exporting, aspects of manufacturing and marketing in foreign markets, and the application of the functions of business to an international business operation.

**Prerequisites: ECO 213, ECO 223 or concurrent with ECO 223**

**BA 3113 BUSINESS INTERNSHIP (3 HRS.)**

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: Sophomore standing or permission of the instructor**

**BA 403 BUSINESS AND PUBLIC POLICY 3-0-3**

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.

**Prerequisites: MGT 363, ECO 223, LAW 203, MK 203, or permission of the instructor (same as ECO 453)**

**BA 423 ENTREPRENEURSHIP 3 CR**

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, Senior business major or permission of the instructor**

**BA 400X INDEPENDENT RESEARCH IN BUSINESS VARIES (1-3 HRS.)**

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.)

**Prerequisites: Senior standing, permission of the instructor or Department Chair, and the Dean of the Ketner School of Business**

**BA 6203 NONPROFIT SECTOR FOUNDATIONS (3 HRS.)**

An examination of the social and legal history of nonprofit organizations in the United States, to develop an historical perspective and a sense of magnitude, scope, and functions of the nonprofit sector and its relationships with business and government. This course will first explore the theoretical bases upon which social scientists have sought to understand the role of the nonprofit sector in our economy and in our political and social systems, and will explore the issues that will shape the future of the sector. Learners will also receive a basic grounding in the laws and regulations governing nonprofit organizations. Content will include the procedures for incorporating, reporting, and maintaining tax-exempt status as a nonprofit organization, a familiarity with legal principles and research methods, and an overview of the legal, regulatory, and policy issues facing contemporary nonprofit organizations.

**Prerequisites: All LDR Core (5000-level) courses OR admission to non-degree graduate certificate program**

**BA 6243 QUANTITATIVE METHODS FOR NONPROFIT ORGANIZATION PLANNING AND EVALUATION (3 HRS.)**

This course will give students working knowledge of data analysis, statistical concepts, use of computers, research designs for program planning and evaluation, and quantitative techniques for problem solving. The intent is to ensure that executives and leaders are able to effectively utilize and interpret statistical data, technical reports, research findings, and evaluation studies, and employ basic quantitative methods in their own analysis of programs, problems and policies.

**Prerequisite: All LDR Core (5000-level) courses OR admission to non-degree graduate certificate program**

**BA 6263 NONPROFIT CAPSTONE (3 HRS.)**

This course is the capstone course for all students in the Nonprofit Concentration. The capstone is a special project conducted in a nonprofit organization. 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. It is anticipated that most projects will be arranged within agencies in which students currently work. The capstone experience affords each student an opportunity to go through a process that will generate a solution(s) to a critical problem or issue for the organization. **Prerequisite: All LDR Core (5000-level) Courses and LDR 6203, LDR 6223, LDR 6233, LDR 6243. Students must complete this course last in the MSL Program**

**BA 6603 LEADING THE SUSTAINABLE BUSINESS (3 HRS.)**

This course emphasizes the three aspects of sustainable business that improve a firm's long-term performance: managing risks (regulatory, reputation, litigation, and market), values-driven leadership, and recognizing market opportunities created by environmental and social challenges. Students will learn how to articulate the business case for sustainability, develop and lead internal and external coalitions needed to drive organizational change, and implement metrics for measuring progress and providing accountability.

**Prerequisites: All LDR Core (5000-level) courses OR admission to non-degree graduate certificate program**

**BA 6643 SUSTAINABILITY AND BUSINESS OPPORTUNITY (3 HRS.)**

The primary objective of this course is to provide students with the skills, practical knowledge and experience in understanding needs not met effectively by current business practices and in developing innovative and proactive business strategies to address them. They will realize the sustainability challenges business and society are facing, how sustainability can be a business opportunity, and how businesses can increase their competitive advantage through sustainable strategies and innovation. The course emphasizes on the tools necessary to perform each business function (such as marketing, manufacturing, distribution, purchasing, HR R&D, information systems, finance, accounting) taking environmental and social implications into account.

**Prerequisites: All LDR Core (5000-level) courses OR admission to non-degree graduate certificate program**

**BA 6923 MANAGERIAL ACCOUNTING & FINANCE (3 HRS.)**

This course is an introduction and examination of essential accounting and financial 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.

**Prerequisites: All LDR Core (5000-level) courses OR admission to non-degree graduate certificate program**

**BA 6933 STATISTICS AND QUANTITATIVE METHODS (3 HRS.)**

This course will provide the students with statistical tools and techniques that will enable them to make an immediate impact in their careers. Additionally, it presents an overview of the various primary and secondary research methodologies used in the business world and the application of statistical techniques to those strategies. This course will be realistically oriented and numerous business examples and cases will be analyzed. This course is a prerequisite LDR 6366 and students will be formulating analytical research methods, problem statement, and capstone proposal.

**Prerequisites: Business Administration Concentration content courses – LDR 6323**

**BA 6943 STRATEGIC MARKETING MANAGEMENT (3 HRS.)**

This course provides tools and methods essential to analyzing market based threats and opportunities, and developing, implementing, and evaluating alternative marketing strategies. Students will come to understand how product, price, place, and promotion contribute to the marketing mix as you explore research-based insights into consumer behavior. Special emphasis is given to the role of marketing activities in the business enterprise and their utilization to achieve a sustainable competitive advantage.

**Prerequisites: Business Administration Concentration content courses – LDR 6323, 6333**

**BA 6953 MANAGING BUSINESS INFORMATION SYSTEMS (3 HRS.)**

This course examines methodologies to assist in analyzing and designing computer-based information systems for business applications. Addresses policy and management issues surrounding information systems in today's enterprises: strategic use, organizational impact,

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project management, human resource issues and other topics germane to understanding management information systems.

**Prerequisites: Business Administration Concentration content courses – LDR 6323, 6333, 6343**

### **BA 6963 BUSINESS ADMINISTRATION CAPSTONE (3 HRS.)**

This course is the capstone course for all students in the Business Administration Concentration. The capstone is an integrative approach to the formulation and implementation of organizational strategy and policy. Students will apply the knowledge and skills acquired in their courses to the work environment using the business plan model. This course focuses on organizational performances as it relates to mission, goals and objectives. You will get practice defining multi-faceted problems and their causes; analyzing internal and external environments; reviewing key corporate and business strategies; formulating alternative strategic options; and addressing the challenges of implementation. Emphasis is on the ethical dimensions of problem solving at the general management level.

**Prerequisites: Business Administration Concentration content courses – LDR 6323, 6333, 6343, 6353 Students must complete this course last in the MSL Program**

## **BIOLOGY**

### **BIO 103 GENERAL BIOLOGY (NO LAB) 3 CR**

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 3-2-4**

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.**

### **BIO 113 PRINCIPLES OF BIOLOGY (NO LAB) 3 CR**

Five basic topics are discussed in some detail: the chemical logic of living systems, structure and function at the sub cellular and cellular levels, cell energetics, cell division, genetics, and evolution. 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.

### **BIO 114 PRINCIPLES OF BIOLOGY I 3-2-4**

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.

**BIO 124 PRINCIPLES OF BIOLOGY II 3-2-4**

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: BIO 114**

**BIO 200X INTERNSHIP IN NATIVE PLANT PROPOGATION (VARIES 1-2 CREDIT HOURS)**

Work with local plant grower propagating plants and seeds. Fall semester will involve seed collection, processing, and storage for propagation or marketing. Spring semester will involve growing of plants in greenhouses, with some possible installation into seed production beds. Either semester may include seed bed maintenance. May be repeated once in alternative semester. **Prerequisite: BIO 114**

**BIO 211 CONSERVATION LAB 0-2-1**

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.

**Corequisite/Prerequisite: BIO 213**

**BIO 213 CONSERVATION 3-0-3**

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.

**Corequisite/Prerequisite: BIO 211; BIO 124**

**BIO 222 FLORIDA KEYS TRIP 0-4-2**

Trip to Florida Keys each May to observe native habitats and wildlife. May include snorkeling, kayaking, hiking, camping, boating, sailing, and data collection. SCUBA diving is optional. Open to non-science majors. **Prerequisite: BIO 104 or BIO 124**

**BIO 243 HUMAN ANATOMY AND PHYSIOLOGY (NO LAB) 3 CR**

The anatomical and physiological features of each organ system are identified.

**Prerequisite: BIO 103 or BIO 113**

**BIO 253 HUMAN ANATOMY (NO LAB) 3 CR**

The anatomical features of each organ system are identified. **Prerequisite: BIO 103 or BIO 113**

**BIO 254 HUMAN ANATOMY 3-2-4**

The anatomical features of each organ system are identified. Microstructure observation and detailed dissection in the laboratory. **Prerequisite: BIO 104 or BIO 114**

**BIO 274 GENERAL ECOLOGY 3-2-4**

A study of the interactions of organisms and environments, this course focuses on individuals, populations, communities, ecosystems, landscapes and cycling of matter within energy systems.

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Investigations focus on techniques to gauge interactions between the biological and physical environments, field and conceptual sampling methods, statistical analysis, population models, and an exploration of emerging technologies in ecology. **Prerequisites: BIO 124, MA 253**

### **BIO 281 MARINE BIOLOGY LAB 0-3-1**

A laboratory class to accompany BIO283. Application of identification, sampling and analytical techniques to aquatic organisms and their habitats of local lakes and possibly one of the Great Lakes. Analysis of remotely sensed data. Includes three all-day or overnight required field trips. Requires snorkeling equipment. May provide opportunity to become SCUBA certified for an additional fee. **Prerequisite: BIO 283**

### **BIO 283 MARINE BIOLOGY 3-3-3**

An introduction to organisms and processes in the marine environment, including function, biodiversity, and ecology of organisms. Topics include: the chemical and physical environment; the ecology of pelagic and benthic organisms, including those from rocky coasts, unconsolidated shores, and coral reefs; benthic plants and phytoplankton; zooplankton and nekton; marine invertebrates, fishes; marine productivity and fisheries; marine pollution and conservation.

**Prerequisite: BIO 104 or BIO 124**

### **BIO 304 PLANT BIOLOGY 3-3-4**

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 114**

### **BIO 314 ANIMAL BIOLOGY 3-2-4**

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**

### **BIO 324 MICROBIOLOGY 3-2-4**

The isolation, growth, structure, function, heredity, and identification of microorganisms with emphasis on their relationship to humans. **Prerequisites: BIO 254 or CH 114**

### **BIO 334 ENVIRONMENTAL BIOLOGY 3-2-4**

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**

### **BIO 343 CELL BIOLOGY 3-2-4**

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: BIO 114**

**BIO 354 HUMAN PHYSIOLOGY 3-2-4**

The fundamental physical chemical bases of osmoregulation, circulation, respiration (both at organism and cell levels), nerve and muscle function, nutrition and endocrine function are studied. Laboratories include electromechanical studies of isolated muscle and nerve preparations, osmoregulation in decapods, and the electrical activity of the heart.

**Prerequisites: BIO 254, CH 114**

**BIO 364 TOXICOLOGY 3-3-4**

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. **Prerequisites: BIO 114, CH 114 (SAME AS CH 364)**

**BIO 374 FORENSIC BIOLOGY 3-2-4**

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 104 or BIO 114**

**BIO 404 EMBRYOLOGY 3-3-4**

Study of structural, physiological, and molecular levels of development processes. A descriptive and experimental analysis of developing systems with emphasis on ordates.

**Prerequisite: BIO 124**

**BIO 413 ENTOMOLOGY 2-2-3**

Integrated studies of the principal morphological, physiological, ecological and systematic relationships of insects. **Prerequisite: BIO 114**

**BIO 414 GENETICS 3-3-4**

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**

**BIO 434 BIOCHEMISTRY 3-3-4**

A study of the chemistry, kinetics, energetics, and metabolic pathways of biological molecules such as carbohydrates, lipids, proteins, nucleic acids and enzymes are discussed and supported by laboratories that illustrate biochemical reactions, separations, enzyme kinetics, and analysis.

**Prerequisites: CH 211, CH 213 (Same as CH 434)**

### **BIO 443 PATHOLOGY 3-3-3**

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. The subspecialty of forensic pathology will also be discussed.

**Prerequisites: BIO 114, junior or senior science major**

### **BIO 454 MOLECULAR BIOLOGY 3-3-4**

This course provides a comprehensive overview of the key concepts in molecular biology. Topics to be covered include nucleic acid structure and functions, biochemistry of DNA, chromosome structure, regulation of gene expression in prokaryotes and eukaryotes. Extended topics will include biotechnology methods, genetic engineering, gene therapy, protein functions, cellular communication, and programmed cell death.

**Prerequisites: BIO 114, CH 211, CH 213**

### **BIO 400X SPECIAL ASSIGNMENTS IN BIOLOGICAL SCIENCES VARIES (1-4 HRS.)**

Directed reading, independent study, or research, supervised laboratory or field work. The number of credit hours will be determined by the scope of the assignment.

**Prerequisite: Permission of department chair**

## **BIOMEDICAL ENGINEERING**

### **BME 2013 INTRODUCTION TO BIOMEDICAL ENGINEERING 3-0-3**

An introduction or overview of biology, chemistry (including organic chemistry), and physiology as they relate to biomedical engineering.

**Prerequisites: CH 104, MA 134**

### **BME 3003 INTRODUCTION TO BIOMECHANICS 3-0-3**

An introduction to the kinematic geometry of human motion and the kinematics of individual human joints. Quantitative and qualitative descriptions of the action of muscles in relation to human and animal movement. Muscle models, receptors, and reflexes with application to control of multi-joint movement. Forward and inverse dynamics of multi-joint, muscle-driven systems.

**Prerequisites: BME 2013 and ES 223**

### **BME 3103 INTRODUCTION TO BIOMATERIALS 3-0-3**

introduction to the study of both biological materials (bone, muscles, etc.) and materials for medical applications. Topics include structure-property relationships for skin, bone, ligaments, tendons, muscle, and organs; the effects of pathology and age on material properties of tissues and organs; interactions between biological tissues and biomaterials; biocompatibility; design constraints, failure modes, and manufacturing limitations, ASTM and ISO standards for biomaterial.

**Prerequisites: CH 104 or CH 155H, BME 2013, and ES 233**

**BME 4303 BIOCHEMICAL ENGINEERING 2-3-3**

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)**

**BME 4403 BIOMEDICAL MEASUREMENTS AND INSTRUMENTATION 2-2-3**

Physiological signals, origin of biopotentials (ECG, EMG, EEG), biomedical transducers and electrodes. Biomedical signal detection, amplification, and filtering. Analog front-ends of biomedical instruments. Electrical safety in medical environment. Basic concepts of instrumentation include design criteria and operational analysis, including principles of transduction and signal processing. Practical experience is gained through use of hands-on design, construction, and testing of biomedical devices.

**Prerequisite: PH 234 and ES 253 or equivalent**

**BME 4603 BIOMEDIAL TRANSPORT I 3-0-3**

This course introduces the basic principles of mass, energy, and momentum conservation equations. Biomechanics transport phenomena are applied to biological flows, design of medical devices, and bioengineered tissues.

**Prerequisite: ES 313 or CHE 313, MA 223**

**BME 4613 BIOMEDICAL TRANSPORT II 3-0-3**

Advanced methods of analyzing and predicting transport of fluids, heat transfer, and species in biological systems.

**Prerequisite: BME 4603**

**BME 4853 BIOMEDICAL ENGINEERING DESIGN I 2-2-3**

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 BME 4863.

**Prerequisite: BME 3003, BME 3103, ES 313 or ChE 313**

**BME 4863 BIOMEDICAL ENGINEERING DESIGN II 1-4-3**

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 BME 4853.

**Prerequisite: BME 4853**

## **CIVIL ENGINEERING**

**CE 1021 COMPUTER TOOLS FOR CIVIL ENGINEERING 1-0-1**

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

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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 2001 BASIC SURVEYING LABORATORY 0-2-1**

Field work component of the basic surveying course. Some of the field work will include the use of automatic and laser levels, total station instruments and data collectors, and basic GPS devices.

**Corequisite: CE 2003**

### **CE 2003 BASIC SURVEYING 3-0-3**

An introductory course in the theory and practice of basic land surveying. Course topics include measurements of angles, directions, and distances; traverse computations; simple vertical and horizontal curves; earthwork and GP. **Corequisites: MA 134, CE 2001**

### **CE 2013 FLUID MECHANICS 3-0-3**

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: Grade of "C" or better in ES 213; Corequisite: MA 213**

### **CE 3101 ENVIRONMENTAL ENGINEERING LABORATORY (AQUEOUS) 0-2-1**

Standard methods for analysis of water and wastewater; measurement of fundamental properties and characteristics of dissolved and particulate constituents in water; sampling techniques and preservation of samples; presentation and interpretation of analytical data.

**Corequisite: CE 3103**

### **CE 3103 ENVIRONMENTAL ENGINEERING (AQUEOUS) 3-0-3**

Environmental engineering issues, fundamentals, and applications including hydrology, water treatment, water quality management, and wastewater treatment. Laboratory portion of the course covers common environmental experiments and field trips pertaining to the aforementioned topics.

**Prerequisite: CH 114; Corequisites: ES 323 or equivalent, CE 3101**

### **CE 3201 CIVIL ENGINEERING MATERIALS LABORATORY 0-2-1**

Testing and evaluation of physical and mechanical properties of engineering materials such as steel, Portland cement, concrete, masonry, asphaltic concrete, and timber.

**Corequisite: CE 3203**

### **CE 3203 CIVIL ENGINEERING MATERIALS 3-0-3**

Testing and evaluation of physical and mechanical properties of engineering materials. Origin, manufacture, and structural applications of metals, aggregates, bituminous materials (including superpave), portland cement, and concrete. **Corequisite: CE 3201; ES 243**

**CE 3301 HYDRAULIC ENGINEERING LABORATORY 0-2-1**

Flow measurement; energy losses in pipe networks; momentum of jet; Bernoulli's Equation; water surface profiles and controls; hydraulic jumps, specific energy in open channels.  
**Corequisite: CE 3303**

**CE 3303 HYDRAULIC ENGINEERING 3-0-3**

Fundamental principles and design of water and wastewater supply, storm water and sanitary sewer systems and their components, including pipes, pumps, storage facilities, detention basins, open-channels, and culverts. **Prerequisite: Grade of "C" or better in ES 323; Corequisite: CE 3301**

**CE 3501 STRUCTURAL ANALYSIS LABORATORY 0-2-1**

Classification of structures; Force and deflection analysis of statically determinate beams, frames, and trusses by classical methods; Analysis of statically indeterminate beams and frames using the moment distribution method; Computer modeling and analysis of structures; Load effects, tributary loads, load paths, and ASCE load combinations; Construction of reaction force, shear and moment envelopes using influence diagrams.

**Prerequisite: Grade of "C" or better in ES 243; Corequisite: CE 3503**

**CE 3503 STRUCTURAL ANALYSIS 3-0-3**

Classification of structures; Force and deflection analysis of statically determinate beams, frames, and trusses by classical methods; Analysis of statically indeterminate beams and frames using the moment distribution method; Computer modeling and analysis of structures; Load effects, tributary loads, load paths, and ASCE load combinations; Construction of reaction force, shear and moment envelopes using influence diagrams.

**Prerequisite: Grade of "C" or better in ES 243; Corequisite: CE 3501**

**CE 3521 STRUCTURAL DESIGN LABORATORY 0-2-1**

Introduction analysis and design of reinforced concrete, structural steel, and timber members subjected to tension, compression, and flexural loads. Application codes and specifications.

**Prerequisite: Grade of "C" or better in CE 3503; Corequisite: CE 3523**

**CE 3523 INTRODUCTION TO STRUCTURAL DESIGN 3-0-3**

Introduction analysis and design of reinforced concrete, structural steel, and timber members subjected to tension, compression, and flexural loads. Application codes and specifications.

**Prerequisite: Grade of "C" or better in CE 3503; Corequisite: CE 3521**

**CE 3603 TRANSPORTATION ENGINEERING (3-0-3)**

An introduction to the basic design, operation, control, and planning of highway transportation. Topics include an overview of project phases and the history of transportation as well as the fundamentals of traffic operations, user characteristics, capacity, and level of service, geometrics, traffic signal timing, and transportation planning. An introduction to basic concepts and terminology for air, rail, and freight engineering will be covered.

**Prerequisite: MA 164**

**CE 3701 SOIL MECHANICS LABORATORY 0-2-1**

Students typically perform the following laboratory tests: Atterberg Limits, sieve and hydrometer analyses, Proctor compaction, hydraulic conductivity, 1-D consolidation, direct

shear, and unconfined compression. In-situ sampling and visual classification of soils will also be performed. **Corequisite: CE 3703**

**CE 3703 SOIL MECHANICS 3-0-3**

The course serves as an introduction to geotechnical engineering and provides an overview of the fundamental properties and behavior of soils. Topics to be presented include index properties, soil classification, phase relationships, compaction, subsurface exploration, seepage, shear strength bearing capacity, and consolidation.

**Prerequisite: ES 243; Corequisite: CE 3701**

**CE 4103 ENVIRONMENTAL ENGINEERING (NON-AQUEOUS) 3-0-3**

Environmental engineering issues, fundamentals, and applications including air pollution, solid waste management, hazardous waste management, and ionizing radiation.

**Prerequisite: CH 114**

**CE 4113 HAZARDOUS WASTE ENGINEERING 3-0-3**

A study of hazardous waste regulation, treatment, disposal, and remediation of contaminated sites. Evaluation of unit operations and processes of importance in the treatment and disposal of common organic and inorganic hazardous wastes. Students conduct group design projects and/or presentations.

**Prerequisite: CE 4103 or CE 3103**

**CE 4123 WATER TREATMENT PRINCIPLES AND DESIGN 3-0-3**

Design of water treatment plants by application of basic and engineering sciences, hydraulics, chemistry, and physics. Students conduct group design projects and/or presentations. Unit operations are evaluated and designed for conventional and advanced treatment processes.

**Prerequisite: CE 3103**

**CE 4133 WASTEWATER TREATMENT PRINCIPLES AND DESIGN 3-0-3**

Design of wastewater treatment plants by application of basic and engineering sciences, hydraulics, chemistry, biology, and physics. Plant layouts as well as the design of the elements of the plants and their operation are covered. Students conduct group design projects and presentations. **Prerequisite: CE 3103**

**CE 4303 OPEN CHANNEL HYDRAULICS 3-0-3**

Advanced topics in open-channel hydraulics, including design of hydraulic structures, uniform flow, rigid and loose boundary channel design, gradually varied flow, unsteady flow, and flood routing techniques. **Prerequisite: CE 3303**

**CE 4323 ENGINEERING HYDROLOGY 3-0-3**

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: ES 323, CE 3303 Corequisite: MA 393**

**CE 4333 DESIGN OF WATER DISTRIBUTION SYSTEMS AND SEWERS 3-0-3**

Theory of pipe networks with application to the analysis and design of municipal water distribution systems, infiltration and inflow. Wastewater flows and design of storm, sanitary and combined sewers. **Prerequisite: CE 3303**

**CE 4523 ADVANCED STRUCTURAL DESIGN 3-0-3**

Analysis and design of structural steel and reinforced concrete connections. Design of reinforced concrete foundations. Introduction to pre-stressed concrete design. Application of codes and specifications. **Prerequisite: Grade of "C" or better in CE 3521 and 3523**

**CE 4553 TIMBER DESIGN 3-0-3**

Analysis, proportioning, and connection of structural members in timber. Lateral wind force resisting systems in timber structures. Specifications and codes.

**Prerequisite: CE 3503**

**CE 4563 BRIDGE ENGINEERING 3-0-3**

Application of CE 3513 and CE 3533 to the design of bridges. AASHTO load specifications. Design of single span bridges and continuous beam bridges

**Prerequisites: CE 3513 and CE 3533 or permission of the instructor**

**CE 4603 HIGHWAY GEOMETRIC DESIGN**

Basic principles and techniques of geometric design of highways and streets. Safety and comfort for road users with due regard to social, economic and environmental constraints. Dimensions and layout of visible highway features such as alignment, sight distance and intersection. Applications of national design standards and controls criteria.

**Prerequisite: CE 3603**

**CE 4613 CONSTRUCTION METHODS AND EQUIPMENT 3-0-3**

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 3201 and 3203**

**CE 4703 SPECIAL TOPICS IN GEOTECHNICAL ENGINEERING 3-0-3**

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**

**CE 4713 FOUNDATION ENGINEERING 3-0-3**

Evaluation of subsurface conditions in order to select appropriate foundations for structures. Topics include subsurface exploration program, evaluation of bearing capacity and settlement shallow foundations, the design of driven piles, auger-cast piles, drilled shaft foundations, and the analysis/design of intermediate foundations, such as pin piles and geopiers.

**Prerequisite: CE 3703**

**CE 4723 PAVEMENT DESIGN 3-0-3**

Design of flexible and rigid highway and airport pavements. Topics include traffic quantity estimates, subgrade testing and properties, pavement materials testing and properties, AASHTO, Asphalt Institute, and PCA design methods, reinforced subbase design, permeable pavement design, and rigid and flexible overlays.

**Corequisites: CE 3203, CE 3703**

**CE 490X SPECIAL PROBLEMS IN CIVIL ENGINEERING (VARIES 1-4 HRS.)**

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**

**CE 4912 CIVIL AND ENVIRONMENTAL ENGINEERING DESIGN SEMINAR 2-0-2**

Project selection and initial scope of work development for major design experience which integrates fundamental concepts of basic sciences, engineering sciences, engineering design, and communication skills. The first of a two semester senior project design sequence.

**Prerequisite: 3 of 4 from the following courses: CE 3103, CE 3301, CE 3503, CE 3703**

**CE 4914 CIVIL AND ENVIRONMENTAL ENGINEERING DESIGN 0-4-4**

An integrated approach to the design of civil engineering facilities, from inception, feasibility, planning, socioeconomic considerations, environmental impact, safety, and engineering analysis and design to a final project report. The second of a two semester senior project design sequence.

**Prerequisite: Must have taken CE 4912 the previous semester**

**CE 5503 ADVANCED STRUCTURAL ANALYSIS 3-0-3**

Computer modeling and analysis of structures using flexibility and stiffness methods. Applications include 2- and 3-dimensional models of buildings, bridges, and industrial facilities.

**Prerequisite: Graduate standing and/or permission of the instructor.**

**CE 5513 STRUCTURAL DYNAMICS 3-0-3**

Analysis of structural systems subjected to time-varying demands (e.g., seismic, wind, blast, fluid, moving loads, machines, etc.). Solutions by classical and numerical methods. Applications to earthquake engineering and collapse analysis.

**Prerequisite: Graduate standing and/or permission of the instructor.**

**CE 5523 FINITE ELEMENT METHODS 3-0-3**

An introduction to the finite element method from both engineering and mathematical points of view. The mathematical foundations of the method are presented along with their physical interpretations. Applications are focused on but not limited to structural mechanics. Standard procedures taken in developing stand-alone finite element computer codes or applying larger public domain or commercial finite element software packages to analyze particular problems are also presented. **Prerequisite: Graduate standing and/or permission of the instructor.**

### **CE 5533 ADVANCED SOLID MECHANICS 3-0-3**

Extension of one-dimensional, linear problems conventionally treated in undergraduate solid mechanics courses into more general, multi-dimensional problems. Topics include the motion and deformation of a continuous body, various stress measures, nonlinear constitutive modeling, nonlinear geometry, Lagrangian and Eulerian formulations. Additional topics may include indicial notation, linear elastic fracture mechanics, stability, and fatigue.

**Prerequisite: Graduate standing and/or permission of the instructor.**

### **CE 5553 STRUCTURAL DESIGN LOADS 3-0-3**

In-depth application and interpretation of structural design loads for civil engineering structures. Topics include an overview of the background and history of design codes and load standards, design formats, selection of code specifications, snow, wind, and seismic load calculations. Course includes hands-on case studies and projects. Loads for other applications may also be included such as renovation, historic preservation, or forensic engineering applications.

**Prerequisite: Graduate standing and/or permission of the instructor.**

### **CE 5563 STRUCTURAL SYSTEMS 3-0-3**

Study of different types of structural systems used in the building environment and how the various components of the structure work together as a whole. The course focuses on the behavior and design of moment frames, braced frames, shear walls, and combined systems. Additional topics may include staggered braces, outriggers, and tall buildings.

**Prerequisite: Graduate standing and/or permission of the instructor.**

### **CE 5573 ADVANCED CONCRETE DESIGN 3-0-3**

Continuation of CE 3533. Design of concrete systems related to buildings. Emphasis on slab-beam-girder system design. Torsion, continuity and length effects in reinforced concrete. One way slab systems, continuous beams, and slender columns. Design philosophies of codes and standards. **Prerequisite: Graduate standing and/or permission of the .**

### **CE 5593 SPECIAL TOPICS IN STRUCTURES 3-0-3**

Special topics frequently encountered in structural engineering practice. Topics selected to match interests of students and instructor. May include advanced structural mechanics, collapse modeling, structural renovation, forensic engineering, earthquake engineering, condition evaluation and inspection, structural reliability, and numerical methods.

**Prerequisite: Graduate standing and/or permission of the instructor.**

## **CHEMISTRY**

### **CH 104 GENERAL CHEMISTRY I 3-3-4**

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**

### **CH 104H HONORS GENERAL CHEMISTRY I 3-3-4**

Fundamentals of chemistry will be reviewed and specific topics discussed in-depth in a student-centered atmosphere. The course is geared towards collaborative learning and traditional

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lectures will be kept to a minimum. Topics include, but are not limited to, atomic structure, stoichiometry, thermochemistry, properties of solution, properties of matter.

**Prerequisite: MA 113 and admission into the Honors Program, or permission of the instructor.**

### **CH 114 GENERAL CHEMISTRY II 3-3-4**

A continuation of CH 104. Emphasis is on chemical equilibria, thermodynamics, kinetics, acid-base reactions, electrochemistry, and organic chemistry. Includes laboratory time.

**Prerequisite: CH 104**

### **CH 114H HONORS GENERAL CHEMISTRY II 3-3-4**

A continuation of CH 104H. The course will be structured similarly to CH 104H with collaborative, student-centered learning emphasized. Topics include, but are not limited to, chemical equilibria, thermodynamics, kinetics, acid-base reactions, electrochemistry and organic chemistry. **Prerequisite: CH 104H or permission of the instructor**

### **CH 144 CHEMISTRY — IDEAS AND APPLICATIONS 3-2-4**

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.

### **CH 155H HONORS ADVANCED GENERAL CHEMISTRY 3-3-5**

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**

### **CH 203 ORGANIC CHEMISTRY I 3-0-3**

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.

**Prerequisite: CH 114**

### **CH 211 ORGANIC CHEMISTRY I LABORATORY 0-3-1**

Laboratory synthesis and experiments illustrative of the methods used in working with organic compounds. **Corequisite: CH 203**

### **CH 213 ORGANIC CHEMISTRY II 3-0-3**

A continuation of CH 203 with a study in a similar manner of aromatic compounds.

**Prerequisite: CH 203**

### **CH 221 ORGANIC CHEMISTRY II LABORATORY 0-3-1**

The laboratory work illustrates the synthesis and reaction of aromatic compounds.

**Prerequisite: CH 211; Corequisite: CH 213**

**CH 234 QUANTITATIVE CHEMICAL ANALYSIS 3-3-4**

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**

**CH 244 INORGANIC CHEMISTRY 3-3-4**

An introduction to inorganic chemistry, including the study of coordination compounds, bonding in transition metals, symmetry, descriptive chemistry of elements, and complex ions. **Prerequisite: CH 114**

**CH 324/324L CHEMICAL INSTRUMENTAL ANALYSIS 3-3-4**

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. **Prerequisite: CH 213, CH 234**

**CH 351 PHYSICAL CHEMISTRY I LABORATORY 0-3-1**

Laboratory experiments included in the areas studied in CH 353. **Prerequisite: CH 234; Corequisite: CH 353**

**CH 353 PHYSICAL CHEMISTRY I 3-0-3**

An in-depth study in real gases, thermodynamics, kinetics, chemical and physical equilibrium, and electrochemistry. **Prerequisites: CH 114, MA 213, PH 224**

**CH 361 PHYSICAL CHEMISTRY II LABORATORY 0-3-1**

Laboratory experiments included in the areas studied in CH 363. **Prerequisite: CH 353; Corequisite: CH 363**

**CH 363 PHYSICAL CHEMISTRY II 3-0-3**

Fundamentals of quantum theory of atoms and molecules, and spectroscopy. **Prerequisite: CH 353**

**CH 364 TOXICOLOGY 3-3-4**

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. **Prerequisites: BIO 114, CH 114 (SAME AS BIO 364)**

**CH 374 FORENSIC CHEMISTRY 3-2-4**

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The course includes a general discussion of the important relationships between chemistry and forensic science in today's and historical contexts. Basic statistical methods, data handling, and quality control procedures are discussed. The quality control and quality assurance sections focus on the responsibilities of the analyst, the laboratory, and the certification requirements. An introduction to the instruments and techniques involved in forensic chemical analysis include thin layer and paper chromatography, gas chromatography-mass spectrometry, FT-infrared and differential scanning calorimetry. Many of these instruments are used by students in the laboratory to analyze drug surrogates, accelerants, colorants and pigments, inks and paints, and polymers and fibers. **Prerequisite: CH 234 and CH 203**

### **CH 424 ADVANCED INSTRUMENTAL ANALYSIS 3-2-4**

Theory and practice of modern instrumental methods of analysis. Fundamental principles, applications, and limitations of various instrumental methods will be discussed. Particular emphasis will be placed on detection limits, sources of "noise", and the methods used to reduce noise and enhance signal strength. **Prerequisite: CH 324**

### **CH 434 BIOCHEMISTRY 3-2-4**

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. **Prerequisite: CH 211, CH 213 (same as BIO 434)**

### **CH 400X SPECIAL ASSIGNMENTS IN CHEMISTRY VARIES (1-6 HRS.)**

Directed readings, independent study, or research.

**Prerequisite: Permission of the Department Chair**

### **CH 474 ADVANCED FORENSIC CHEMISTRY 3-3-4**

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 324 and CH 374**

## **CHEMICAL ENGINEERING**

### **CHE 122 INTRODUCTION TO CHEMICAL & BIOLOGICAL ENGINEERING 2-0-2**

An introduction to the field of Chemical Engineering & Biological Engineering. The tools of Chemical Engineering are introduced including mobile computational devices and Computer applications. Chemical production facilities will be included. Basic Biological Principles are

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reviewed including - The monomers and polymers of biological substances as well as cell structure and function will be introduced. The Central Dogma of biology will be introduced and explained.

**Prerequisite: GE 101**

### **CHE 203 MATERIAL BALANCES 3-0-3**

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; Corequisite: PH 224**

### **CHE 212 ENERGY BALANCES 2-0-2**

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 and CHE 252**

### **CHE 222 SUSTAINABILITY AND PROCESS MEASUREMENT LABORATORY 1-3-2**

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**

### **CHE 252 INTRODUCTION TO STATISTICAL AND COMPUTATIONAL METHODS IN CHEMICAL ENGINEERING 2-0-2**

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**

### **CHE 303 CHEMICAL ENGINEERING FLUID DYNAMICS 3-0-3**

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 both ChE 203 and ChE 212**

### **CHE 313 CHEMICAL ENGINEERING THERMODYNAMICS I 3-0-3**

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: MA 213 and a C or better in CHE 212**

### **CHE 333 UNIT OPERATIONS LABORATORY I 2-3-3**

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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.

**Prerequisite: CHE 222, CHE 252, CHE 303, and CHE 373**

### **CHE 372 CHEMICAL ENGINEERING THERMODYNAMICS II 2-0-2**

Phase and Chemical Reaction equilibrium will be covered in this course. Emphasis is placed on multi-component non-ideal systems. **Prerequisite: CHE 313**

### **CHE 373 CHEMICAL ENGINEERING HEAT TRANSFER 3-0-3**

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 both CHE 203 and 212**

### **CHE 383 MASS TRANSFER 3-0-3**

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**

### **CHE 393 STAGewise SEPARATIONS 3-0-3**

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

**Corequisite: CHE 372**

### **CHE 3103 PLASTICS AND CORROSION 3-0-3**

An introduction to the engineering properties of plastics and the fundamentals of corrosion. The effect of the environment on the corrosion of metals, weathering and the deterioration of plastics are examples of some of the topics covered. **Prerequisites: CH 104, PH 224**

### **CHE 412 APPLIED NUMERICAL METHODS 2-0-2**

Advanced engineering mathematics will be introduced. Numerical techniques will be discussed and applied to chemical engineering problems.

**Prerequisite: CHE 453**

### **CHE 433 UNIT OPERATIONS LABORATORY II 2-3-3**

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**

### **CHE 453 CHEMICAL ENGINEERING KINETICS 3-0-3**

A study of chemical reaction processes with applications to equipment design.

**Prerequisites: CHE 383, CHE 393, MA233**

### **CHE 463 CHEMICAL PROCESS DYNAMICS AND CONTROL 2-3-3**

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An introduction to process dynamics and the application of control systems.

**Prerequisite: MA 233**

### **CHE 473 CHEMICAL PROCESS DESIGN I 3-0-3**

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.

**Prerequisite: CHE 372, CHE 383 and CHE 393**

### **CHE 483 CHEMICAL PROCESS DESIGN II 3-0-3**

Capstone design experience unifying the principles of previous course work. Comprehensive projects that incorporate appropriate engineering standards and multiple realistic constraints.

**Prerequisites: CHE 453, CHE 473, and ES 382**

### **CHE 400X SPECIAL PROBLEMS IN CHEMICAL ENGINEERING VARIES (1-4 HRS.)**

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 4043 AIR ENVIRONMENTAL CONTROL 3-0-3**

Air pollution control regulations and the equipment that is used to monitor and control air pollution are studied. Characterization of particulate and gases and vapors are included. Control technologies such as cyclones, ESP, bag houses, incinerators, and adsorption are presented.

**Prerequisite: Junior standing**

### **CHE 4073 BIOCHEMICAL ENGINEERING 2-3-3**

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 (CHE 4073 same as BME 4303)**

### **CHE 4083 PLANT MANAGEMENT 3-0-3**

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**

### **CHE 4173 BIO-SEPARATION PROCESSES 2-3-3**

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, CHE 373 or permission of instructor**

### **CHE 4193 HIGH POLYMER PROCESSES 2-3-3**

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 203**

### **CHE 4223 SELECTED TOPICS IN THE ENGINEERING SCIENCES 3-0-3**

This course is divided into three modules, each five weeks long. The first module will cover basic electricity and circuit analysis, as well as process measurement and instrumentation. The second module will introduce statics and strengths of materials while the final module will introduce the properties of materials and material science. **Prerequisite: PH 224**

### **CHE 4273 PHARMACEUTICAL PROCESSES 2-3-3**

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, CHE 373 or permission of instructor**

## **CHINESE**

### **CHN 113 CHINESE I 3-0-3**

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 3-0-3**

An advanced introduction to Mandarin Chinese language and Chinese culture. Pronunciation, alphabet, and basic grammar skills are emphasized.

**Prerequisite: CHN 113 or by placement**

## **COOPERATIVE EMPLOYMENT**

### **CO 050 CO-OP EMPLOYMENT**

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**

**CO 453 CO-OP WORK EXPERIENCE 3 CREDITS**

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: Senior standing, minimum of three semesters of CO 050 Co-op Employment**

## **COMMUNICATION**

**COM 111 COMMUNICATION: PRACTICES AND PROFESSIONS (0-2-1)**

A lab in which students conduct self-assessment and career planning, considering numerous communication career options, including requisite knowledge and skills, entry and career salary levels, employment projections and effects of new technology and business developments. Graduate and law school options are also considered. Students learn how to conduct successful internship and job searches, including how to develop effective portfolios, job application letters, and resumes, as well as skills in persuasive interviewing.

**COM 123 INTRODUCTION TO NEW MEDIA 3-0-3**

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 3-0-3**

Considers the nature, history, and types of public relations. Analyzes PR's crucial management functions and the role of research in planning, executing, and evaluating PR efforts, as well as changes in PR due to social and new media. Notes PR's relationship to management and marketing as well as PR's varied careers and career flexibility that PR education and training provides.

**COM 163 INTERPERSONAL COMMUNICATION 3-0-3**

Communication concepts and principles pragmatically applied to interpersonal communication in work, college, dating, family, and social settings. Communication exercises, role plays, and case studies enable students to analyze communication dynamics and improve communication skills employing language, nonverbal communication, listening, perception of self and others, relationship development, and assertiveness. Extensive training in conflict management skills and analysis.

**COM 183 WRITING FOR MEDIA 3-0-3**

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 more.

**Prerequisite: ENG 103/104**

**COM 203 MEDIA AND SOCIETY 3-0-3**

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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 103/104**

### **COM 213 BUSINESS COMMUNICATION 3-0-3**

Emphasis on effective research, writing, and document design in project management, including proposals, periodic and progress reports, formal completion reports, and correspondence. Also considers communication in meetings, the employment process, and presentations using PowerPoint. **Prerequisite: ENG 113 or 133**

### **COM 233 INTERCULTURAL COMMUNICATION 3-0-3**

Considers interrelationships between communication and culture, the diversity between and within cultures, and both the challenges and the richness of communication posed by such diversity, including within U.S. culture. Topics include cultural patterns, worldview and perception, cultural identity, verbal and nonverbal communication, listening, family and relationships, and business.

### **COM 243 DIGITAL MEDIA CREATION 3-0-3**

Examines the technologies and techniques used in digital media creation. Work may involve digital photography, video, and other forms as well as integration of these forms into larger pieces of media such as websites and news packages.

### **COM 253 EVENT PLANNING AND PROMOTION 3-0-3**

Considers event planning and promotion as typical duties for public relations professionals. While learning duties, techniques and procedures for promoting and planning and promoting an event either by itself or as part of a larger PR campaign, students plan, promote, and execute a substantial event.

**Prerequisite: COM 153 or sophomore standing**

### **COM 263 THEORIES AND RESEARCH IN COMMUNICATION 2-2-3**

Considers the nature of theorizing and the evolution and usefulness of communication theories. Includes general communication theories and theories specific to contexts and to communication professions, including public relations, organizational communication, journalism, and media. Also considers the nature and use of quantitative, qualitative, and hermeneutic research, both in developing and testing theories and in application by communication professionals.

### **COM 283 SPORTS WRITING 3-0-3**

Techniques, instruction and practice in news gathering, evaluation, reporting, writing and editing local, regional and national sports news. Topics will include research, style, interviewing skills, how newsroom decisions are made for sports stories and features. Each student will be required to submit articles to the Triangle and other local media for possible publication.

**Prerequisites: ENG 113, COM 183**

**COM 293 ARGUMENTATION AND DEBATE 2-2-3**

Develops knowledge and skill in reasoning and decision-making, including how to identify the types, parts, and potential weaknesses of inductive arguments and how to use deductive reasoning to organize arguments in speeches, debate cases, and reasoned writing, such as proposals and reports. After learning how to analyze issues for propositions of fact, value, and policy, and after reasoning and critical listening lab exercises, students debate in lab to sharpen their skills. **Corequisite: SP 203 or permission of instructor**

**COM 301 MEDIA PRACTICUM 0-2-1**

Practical media experience through work at WEAX, The Triangle, the Sports Information Office, Brand and Integrated Marketing, or another approved media-oriented work experience. May be repeated, but only if duties and skills learned are different each time, up to a total of three credits. **Prerequisite: COM Major or Minor, or permission of chair**

**COM 323 THE BUSINESS OF ELECTRONIC MEDIA 3-0-3**

This course examines how electronic media organizations throughout the U.S. are dealing with today's competitive pressures, new technologies, and financial strains. Discuss how radio and television programming...practices that once galvanized families during respective golden ages of radio/TV...to the explosion of electronic media choices that are currently available to audiences and advertisers. **Prerequisite: Junior standing or permission of chair**

**COM 343 WEB CONTENT MANAGEMENT 3-0-3**

Examines blogging, content management software (such as Word Press), distribution of content through social media and other formats, and the business side of the merging online media landscape. **Prerequisite: Junior standing**

**COM 353 PUBLIC RELATIONS WRITING AND PRODUCTION 3-0-3**

Application of persuasive writing and communication principles and of document and visual design principles to the PR writing process, including changes due to social and new media. Develops knowledge and skill in writing, designing, and producing varied PR formats, such as news releases, media advisories, media kits, backgrounders, features, brochures, newsletters, and public service announcements. Considers persuasive factors in electronic media, such as video and audio news releases and new media.

**Prerequisites: COM 213 OR ENG 133, COM 253, or permission of instructor**

**COM 363 RHETORIC AND PERSUASION 3-0-3**

Considers classical and contemporary rhetorical theory and concepts as well as practical persuasion theories and concepts. Discusses rhetoric as not only functioning to get audiences to believe or act a certain way, but also as creating understandings of reality, knowledge, social cohesion and division, and power relationships, and as symbolic action. Particular attention is given to how language choices "frame" views of reality, and students analyze how media persuasively "frame" their understandings. **Corequisite : SP 203**

**COM 373 TOPICS IN COMMUNICATION 3-0-3**

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: Junior standing**

**COM 383 FEATURE REPORTING 3-0-3**

An intermediate look at writing in the media. It examines feature style writing, in particular, such as features, reviews, interviews, profiles, and more across print, broadcast, and online media. **Prerequisite: COM 183**

**COM 413 CORPORATE AND ORGANIZATIONAL COMMUNICATION 3-0-3**

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**

**COM 433 MEDIA LAW AND ETHICS 3-0-3**

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**

**COM 453 PUBLIC RELATIONS PLANNING AND CAMPAIGNS 3-0-3**

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. **Prerequisites: COM 213 or ENG 133**

**COM 483 PUBLIC AFFAIRS REPORTING 3-0-3**

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**

**COM 400X ELECTIVE INTERNSHIP IN COMMUNICATION (VARIES 1 – 3 CREDITS)**

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**

**COM 4013 SENIOR CAPSTONE INTERNSHIP IN COMMUNICATION (3 HRS.)**

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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.**

### **COM 410X INDEPENDENT STUDIES IN COMMUNICATION (Varies 1-4 HRS.)**

An individualized reading and research project in the communication discipline.

**Prerequisite: Permission of the Department Chair**

### **COM 4281 SENIOR COMMUNICATION PROJECT PROPOSAL 1-2-2**

Application of communication principles and skills by planning and developing a formal proposal for a capstone communication campaign or project.

**Prerequisite: Senior Communication major**

### **COM 4292 SENIOR COMMUNICATION PROJECT 0-4-2**

Application of communication principles and skills by implementing and evaluating a capstone communication campaign or project. **Prerequisite: COM 4281**

### **COM 5003 PUBLIC RELATIONS FOR EXECUTIVES 3-0-3**

This course evaluates writing, strategic thinking, creativity, and ethical framework in a real-time context. Exercises include applying strategic communications skills to an existing communications challenge identified by an actual company or organization. Working individually, students will respond to a communication problem or opportunity for the client. Students will be expected to write and present a well-researched, insightful, creative plan that illuminates how strategic considerations will lead to positive outcomes for the client. Comprehensive plans will tell the story of the original research, implementation plan, timelines and budget necessary to meet the client's communication goal. Although the primary focus for the semester is on creating a comprehensive plan, there will be in-class Assignments to review and diagnose mastery of specific concepts in strategic communications planning and responsible communication. **Prerequisite: Graduate standing or permission of instructor**

## **COMMUNITY VOLUNTEER**

### **COV 101 COMMUNITY VOLUNTEER 0-2-1**

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.

## **CRIMINAL JUSTICE**

### **CRJ 502 THE AMERICAN SYSTEM OF JUSTICE (2 HRS.)**

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**

**CRJ 503 SEMINAR IN LAW AND SOCIAL CONTROL (3 HRS.)**

An introduction to legal theory and the moral, practical and legal implications of law as a means of maintaining social order. The course will also examine the impact of economic and political forces on social control.

**Prerequisite: Must be admitted to either the MSCJ or Certificate Program**

**CRJ 513 CRIMINOLOGY (3 HRS.)**

The study of the nature, extent, cause and control of criminal behavior. Students will examine the ways in which crime is measured, identify various crime typologies, and explore a wide range of crime causation theories.

**Prerequisite: Must be admitted to either the MSCJ or Certificate Program**

**CRJ 533 CRIMINAL JUSTICE POLICY FORMATION AND ANALYSIS (3 HRS.)**

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**

**CRJ 553 APPLIED STATISTICS FOR CRIMINAL JUSTICE (3 HRS.)**

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.

**Prerequisite: Must be admitted to either the MSCJ or Certificate Program**

**CRJ 563 PLANNING, & PROGRAM EVALUATION (3 HRS.)**

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: Must be admitted to either the MSCJ or Certificate Program**

**CRJ 593 DEMONSTRATION PROJECT CAPSTONE (3 HRS.)**

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 complete a project that will then be formally presented to a committee of at least two full-time or adjunct professors.

**Prerequisite: CRJ 563**

**CRJ 603 THEORY AND PRACTICE OF PUBLIC ADMINISTRATION (3 HRS.)**

An examination of factors that impact public administration, including organizational design, political relationships, and the environment, with an emphasis on ethical behavior in the public arena. **Prerequisite: Must be admitted to either the MSCJ or Certificate Program**

**CRJ 613 PUBLIC ORGANIZATIONAL BEHAVIORAL AND HUMAN RESOURCE MANAGEMENT (3 HRS.)**

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A study of the importance of organizational planning, quality decision-making and budget management. The course will also examine the methods and procedures necessary for managing in the public arena.

**Prerequisite: Must be admitted to either the MSCJ or Certificate Program**

### **CRJ 623 GOVERNMENTAL ACCOUNTING, FINANCE AND BUDGETING (3 HRS.)**

An in-depth look at accounting, finance and budgeting practices in public administration, including fundamental concepts of accounting principles.

**Prerequisite: Must be admitted to either the MSCJ or Certificate Program**

### **CRJ 643 LAW AND PUBLIC POLICY (3 HRS.)**

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**

### **CRJ 693 PUBLIC ADMINISTRATION DEMONSTRATION PROJECT (3 HRS.)**

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 public administration experience.

**Prerequisite: Must be taken in the final term of the MSCJ or Certificate Program, and may be taken with one other MSCJ course.**

## **COMPUTER SCIENCE**

### **CS 1113 OBJECT-ORIENTED JAVA PROGRAMMING 3-0-3**

An introduction to object-oriented programming using the Java language. Students will: use primitive data types and expressions; understand APIs; effectively use existing classes; use selection and iteration control structures; create classes; use data structures such as arrays; create applets; effectively use debugging techniques and IDE.

**Corequisite: MA 113 or higher**

### **CS 1123 C++ AND OBJECT-ORIENTED DESIGN 3-0-3**

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**

### **CS 1303 INTRODUCTION TO THE WORLD WIDE WEB 3 CR**

Introduction to computer science through the World Wide Web, focusing on the techniques of web-page creation.

**CS 2103 ALGORITHM DESIGN AND ANALYSIS 3-0-3**

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**

**CS 2213 ARCHITECTURE AND OPERATING SYSTEMS 3 CR**

The course reviews digital logic, and investigates the machine representation of data, assembly-level machine organization, memory architecture, and functional control including pipelines. Other topics include the functions of operating systems, and examines processes, interrupts, and kernel modes; concurrency, and scheduling; and memory management. **Prerequisites: CS 1123**

**CS 2503 SOFTWARE ENGINEERING 3-0-3**

Is an introduction to software engineering from 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. **Prerequisite: CS 1123**

**CS 2613 ARTIFICIAL INTELLIGENCE AND INFORMATION 3 CR**

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**

**CS 3223 NETWORK ARCHITECTURE 3 CR**

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**

**CS 3303 NET-CENTRIC COMPUTING 3-0-3**

The development of web-based applications using databases while gaining an understanding of the underlying network concepts. Students will: describe the functions of each layer in the layered network model; setup Ubuntu client/servers including virtual machines; use network management and network security tools; build web applications using Python and PHP; create and integrate MySQL database and SQL in application programs.

**Prerequisite: CS 1123**

**CS 3883 COMPUTER SECURITY 3-0-3**

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

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security protocols in applications; discuss internet privacy and ethical issues; apply security concepts, technologies and best practices to develop secure applications.

**Prerequisite: CS 1123**

### **CS 3933 SOFTWARE ANALYSIS AND DESIGN 3-0-3**

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**

### **CS 4013 COMPUTER GRAPHICS 3 CR**

This course includes both two and three dimensional computer graphics. Topics include windows and view-ports; geometric transformations, hidden surfaces and file formats. It introduces standard libraries such as VCL. **Prerequisites: ECE 263**

### **CS 4023 COMPILER CONSTRUCTION 3 CR**

This course introduces compiler design for procedural languages. Topics include formal grammar, lexical, syntax, and semantic analysis, parsing, code generation and optimization, and compiler writing tools. **Prerequisites: CS 2213**

### **CS 4033 SPECIAL TOPICS 3-0-3**

Addresses advanced topics that vary by year. **Prerequisite: consent of instructor**

### **CS 4103 ADVANCED SOFTWARE DEVELOPMENT 3-0-3**

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**

### **CS 4903 CAPSTONE PROJECT 3 CR**

A team project that requires interactions with users and formal reporting. A student who intends to pursue graduate study and who can demonstrate team work from other experiences may be assigned a solo research project. **Prerequisites: CS 2503**

## **DESIGN ENGINEERING TECHNOLOGY (*SEE ETD*)**

## **DOCTORATE OF PHYSICAL THERAPY**

### **DPT 5111 CARE I 0-2-1**

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,

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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.

**Prerequisite: Accepted into the Doctorate of Physical Therapy program.**

### **DPT 5124 ANATOMY OF MOVEMENT I 2-4-4**

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.**

### **DPT 5134 APPLIED PHYSIOLOGY I 3-2-4**

This is the first of a two courses 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: Accepted into the Doctorate of Physical Therapy program.**

### **DPT 5143 CLINICAL PRACTICE I 1-4-3**

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: Accepted into the Doctorate of Physical Therapy program.**

### **DPT 5152 HEALTH BEHAVIOR SCIENCE 2-0-2**

Students will explore and analyze how human actions, cognitions, communications, and environment affect health, chronic disease, and quality of life across the lifespan. Students will explore evidence and strategies for health promotion through education, policy change, development and implementation of programs, and evaluation of impact and outcomes.

**Prerequisite: Accepted into the Doctorate of Physical Therapy program.**

### **DPT 5162 PROFESSIONAL DEVELOPMENT I 2-0-2**

This is the first of a series of three professional development courses whose focus is 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, therapeutic communication, cultural competency, stress management and conflict resolution.

**Prerequisite: Accepted into the Doctorate of Physical Therapy program.**

**DPT 5211 CARE II 0-2-1**

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: DPT 5111 and satisfactory completion of all coursework in previous semesters**

**DPT 5224 ANATOMY OF MOVEMENT II 2-4-4**

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 thorax, 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: DPT 5124 and satisfactory completion of all coursework in previous semesters**

**DPT 5234 APPLIED PHYSIOLOGY II 3-2-4**

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 endocrine, GI, renal, and reproductive organ systems, as well the influences of physiological changes with growth, aging, nutrition, drugs, and disease. **Prerequisites: DPT 5134 and satisfactory completion of all coursework in previous semesters**

**DPT 5243 CLINICAL PRACTICE II 1-4-3**

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: DPT 5143 and satisfactory completion of all coursework in previous semesters**

**DPT 5254 APPLIED NEUROSCIENCE 3-2-4**

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: DPT 5124; DPT 5134; satisfactory completion of all coursework in previous semesters**

**DPT 5311 CARE III 0-2-1**

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: DPT 5211 and satisfactory completion of all coursework in previous semesters**

**DPT 5343 CLINICAL PRACTICE III 3-0-3**

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 modalities (including massage) 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: Satisfactory completion of all coursework in previous semesters; DPT 5243.**

**DPT 5352 PHARMACOLOGY 2-0-2**

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: DPT 5134 and satisfactory completion of all coursework in previous semesters**

**DPT 5362 OUTCOME ASSESSMENT 2-0-2**

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. A working knowledge of these topics is developed through lecture, discussion and case-based examples. **Prerequisites: DPT 5152; 5243; satisfactory completion of all coursework in previous semesters**

**DPT 5372 EVIDENCE BASE PRACTICE I 2-0-2**

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: Satisfactory completion of all coursework in previous semesters**

**DPT 6111 CARE IV 0-2-1**

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:** DPT 5311+; **satisfactory completion of all coursework in previous semesters**

**DPT 6124 MUSCULOSKELETAL PT I 2-4-4**

This course is the first 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 cervical spine and upper extremities.

**Prerequisites:** DPT 5224; DPT 5343; **satisfactory completion of all coursework in previous semesters**

**DPT 6134 NEUROMUSCULAR PT I 2-4-4**

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 comorbidities. 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:** DPT 5254, DPT 5343, and **satisfactory completion of all coursework in previous semesters**

**DPT 6142 IMAGING AND LABORATORY TESTING 2-0-2**

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:** DPT 5224, DPT 5234, DPT 5352, and **satisfactory completion of all coursework in previous semesters**

**DPT 6152 LIFESPAN I: GROWTH AND DEVELOPMENT 2-0-2**

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:** DPT 5224, DPT 5234, and **satisfactory completion of all coursework in previous semesters**

**DPT 6172 EVIDENCE BASED PRACTICE II 2-0-2**

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: DPT 5372 and satisfactory completion of all coursework in previous semesters**

**DPT 6191 ANATOMY SEMINAR I 0-3-1**

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 student share their results through formal presentations to their peers and clinical experts. **Prerequisites: DPT 5224 and satisfactory completion of all coursework in previous semesters**

**DPT 6211 CARE V 0-2-1**

Clinical Application and Reflection Experience (CARE) V is the fifth 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: DPT 6111 and satisfactory completion of all coursework in previous semesters**

**DPT 6224 MUSCULOSKELETAL PT II 2-4-4**

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: DPT 6124 and satisfactory completion of all coursework in previous semesters**

**DPT 6233 NEUROMUSCULAR PT II 2-4-4**

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: DPT 6134 and satisfactory completion of all coursework in previous semesters**

**DPT 6242 CARDIOPULMONARY PT 2-0-2**

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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:** DPT 5224, DPT 5234, DPT 5243, DPT 5352, and satisfactory completion of all coursework in previous semesters

### **DPT 6252 LIFESPAN II: GERIATRICS 2-0-2**

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:** DPT 6152, and satisfactory completion of all coursework in previous semesters

### **DPT 6272 EVIDENCE-BASED PRACTICE III 2-0-2**

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 faculty member will annually mentor 1-4 groups through this capstone project. Each week a lecture will be delivered or coordinated by the instructor of record and the recitations will be mentored by a DPT faculty member assigned to each group.

**Prerequisites:** DPT 6172, and satisfactory completion of all coursework in previous semesters

### **DPT 6282 HEALTHCARE DELIVERY I 2-0-2**

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 healthcare access, cost, and quality will be explored as well as the effects of the current environment on physical therapy practice, research and education.

**Prerequisites:** DPT 5152, DPT 5362, DPT 6172, and satisfactory completion of all coursework in previous semesters

### **DPT 6291 ANATOMY SEMINAR II 0-3-1**

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 student share their results through formal presentations to their peers and clinical experts.

**Prerequisite:** DPT 6191

**DPT 6314 CLINICAL PRACTICUM (4 HRS.)**

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: DPT 6211, and satisfactory completion of all coursework in previous semesters.**

**DPT 6342 ORTHOTICS AND PROSTHETICS 1-2-2**

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: DPT 5224, DPT 5234, DPT 5362, satisfactory completion of all coursework in previous semesters**

**DPT 6352 PRIMARY CARE PRACTICE 2-0-2**

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: DPT 5152, DPT 6124, DPT 6233, DPT 6272, satisfactory completion of all coursework in previous semesters**

**DPT 6362 PROFESSIONAL DEVELOPMENT II 2-0-2**

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 School of Health Sciences research forum.

**Prerequisites: DPT 5162 and satisfactory completion of all coursework in previous semesters**

**DPT 6382 HEALTHCARE DELIVERY II 2-0-2**

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: DPT 6282 and satisfactory completion of all coursework in previous semesters**

### **DPT 7118 CLINICAL INTERNSHIP I**

During this full-time clinical internship 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: DPT 6314 and satisfactory completion of all coursework in previous semesters**

### **DPT 7128 CLINICAL INTERNSHIP II**

During this full-time clinical internship 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: DPT 7118 and satisfactory completion of all coursework in previous semesters**

### **DPT 7214 CLINICAL INTERNSHIP III**

In this final full-time clinical internship 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 internship students are expected to have demonstrated entry-level physical therapist competency and behaviors.

**Prerequisites: DPT 7128 and satisfactory completion of all coursework in previous semesters**

### **DPT 7262 PROFESSIONAL DEVELOPMENT III**

Students participate in distance learning sessions while on their final clinical internship. The emphasis is on sharing and reflecting on aspects of their internship experience pertinent to their development as professionals. Topics emphasized include leadership, interdisciplinary collaboration, quality and safety standards, billing, rules, regulations, laws. Following the internship students will come together on campus for a final week to participate in seminars on topics such as for effective resume writing and interviewing, exam preparation, and professional career planning.

**Prerequisites: DPT 6362 and satisfactory completion of all coursework in previous semesters**

## **EARTH SCIENCE**

### **EAS 213 PHYSICAL GEOGRAPHY 3-0-3**

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 GEO 213)**

**EAS 253 WEATHER & CLIMATE 3-0-3**

Elementary description of the atmosphere: its motion systems, thermal characteristics, clouds and precipitation, weather map interpretation and analysis; climates of the United States. The course conveys meteorological concepts in a visual, practical, and non-mathematical manner.

**EAS 271 GEOLOGY LABORATORY 0-1-1**

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)**

**EAS 273 GEOLOGY 3-0-3**

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)

## **ELECTRICAL AND COMPUTER ENGINEERING**

**ECE 103 PROTOTYPING AND PROJECTS 2-2-3**

Is an introduction to electrical and computer engineering which includes a strong experimental and project component. Students will: learn the principles of electrical phenomena, the mathematics used to describe power and signals, Boolean logic and its implementation including Programmable Logic Controllers.

**ECE 211 CIRCUITS LABORATORY 0-2-1**

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**

**ECE 213 CIRCUIT ANALYSIS 3-0-3**

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.

**Prerequisite: MA 134; ECE 103**

### **ECE 231 DISCRETE ELECTRONICS LABORATORY 0-2-1**

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 clippers using pn junction diodes; design circuits using TINA simulation software; implement the design in proto board.

**Corequisite: ECE 233**

### **ECE 233 DISCRETE ELECTRONICS 3-0-3**

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**

### **ECE 243 ANALOG SIGNALS 3-0-3**

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, ECE 213 with a grade of "C" or above, ECE 263 with a grade of "C" or above**

### **ECE 261 DIGITAL SYSTEMS LABORATORY 0-2-1**

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**

### **ECE 263 DIGITAL SYSTEMS 3-0-3**

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**

### **ECE 271 MICROCONTROLLERS LAB 0-2-1**

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: Corequisite: ECE 273**

### **ECE 273 MICROCONTROLLERS 3-0-3**

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.

**Prerequisite: ECE 263 and CS 1113 or equivalent; Corequisite: ECE 271**

### **ECE 301 ELECTRICAL MACHINES LABORATORY 0-2-1**

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**

### **ECE 303 ELECTRICAL MACHINES 3-0-3**

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 213; Corequisite: ECE 301**

### **ECE 313 ELECTRICAL POWER 3-0-3**

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**

**ECE 323 DYNAMIC ELECTROMAGNETIC FIELDS 3-0-3**

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**

**ECE 333 ANALOG IC's 3-0-3**

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**

**ECE 351 CMOS VLSI DESIGN LAB 0-2-1**

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**

**ECE 353 CMOS VLSI DESIGN 3-0-3**

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**

**ECE 361 LOGIC & COMPUTER DESIGN LAB 0-2-1**

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**

**ECE 363 LOGIC & COMPUTER DESIGN 3-0-3**

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

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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**

### **ECE 371 EMBEDDED SYSTEMS LABORATORY 0-2-1**

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**

### **ECE 373 EMBEDDED SYSTEMS 3-0-3**

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**

### **ECE 393 SOFTWARE ANALYSIS AND DESIGN 3 CR**

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**

### **ECE 403 DIRECT GENERATION TECHNIQUES 3-0-3**

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**

### **ECE 441 COMMUNICATION SYSTEMS LABORATORY 0-2-1**

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**

### **ECE 443 COMMUNICATION SYSTEMS 3-0-3**

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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 243; Corequisite: ECE 441**

### **ECE 453 RANDOM PROCESSES IN ELECTRICAL AND COMPUTER ENGINEERING 3-0-3**

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**

### **ECE 461 DIGITAL SIGNAL PROCESSING LAB 0-2-1**

MATLAB is used to demonstrate concepts from digital signal processing. Students will: sample and filter audio signals; filter images; demonstrate effects of insufficient sampling, aliasing, rounding, or instability; design digital filters.

**Corequisite: ECE 463**

### **ECE 463 DIGITAL SIGNAL PROCESSING 3-0-3**

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 243; Corequisite: ECE 461**

### **ECE 481 INSTRUMENT SYSTEMS LABORATORY 0-2-1**

This course discusses data acquisition of both analog and digital signals. Students will: process input data from sensors; read data into a computer using multiple methods; characterize signal noise; use Labview for data acquisition and analysis.

**Corequisite: ECE 483**

### **ECE 483 INSTRUMENT SYSTEMS 3-0-3**

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: 481; Prerequisite: ECE 213**

### **ECE 4001 CONTEMPORARY ISSUES FOR ENGINEERS 1-0-1**

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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**

### **ECE 4002 PROJECT MANAGEMENT 2-1-2**

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**

### **ECE 4003 DESIGN PROJECT 3-0-3**

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; 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 initial concept to a functioning prototype; and give an oral report presenting the final product.

**Prerequisite: EE Majors: ECE 4002, ECE 243, ECE 483**

**CpE Majors: ECE 4002, ECE 243, ECE 373**

### **ECE 4113 Special Topics in ECE 3-0-3**

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**

## **ECONOMICS**

### **ECO 213 MICROECONOMICS 3-0-3**

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.

### **ECO 223 MACROECONOMICS 3-0-3**

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.

### **ECO 243 ECONOMICS OF SOCIAL ISSUES 3 CR**

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An economic analysis of social issues, such as the problems of pollution, poverty, crime, and the use of drugs. A study of the economic consequences of various social and economic policies, population pressures and related energy and pollution problems. **Prerequisites: ECO 213 (Same as SOC 243)**

### **ECO 303 QUANTITATIVE ANALYSIS IN BUSINESS 3-0-3**

This course builds on designing operations and applies quantitative techniques to common business problems, preparing the student to make data-driven decisions. Topics include decision theory, Bayesian analysis, forecasting, linear programming, dynamic programming, game theory, transportation models, assignment and scheduling modeling, simulations, and queuing theory. **Prerequisites: MA 253, MGT 353**

### **ECO 323 MONEY AND BANKING 3-0-3**

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 (Same as FIN 323)**

### **ECO 333 PUBLIC FINANCE 3-0-3**

This course involves an investigation of the role of the public sector in economic development. Fiscal policy and the practice of public finance are examined. Topics cover cost functions for public goods, externalities, and fiscal federalism. **Prerequisite: ECO 223**

### **ECO 343 ECONOMIC GEOGRAPHY 3-0-3**

A spiritual approach to economics, the course considers historical, present and future economic activities, developments, and trends, in a global context, with the goal of answering the two basic questions of geography: "where?" and "why there?". **Prerequisite: ECO 223 (Same as GEO 343)**

### **ECO 363 COMPARATIVE ECONOMIC SYSTEMS 3-0-3**

A comparison of the capitalist, socialist, communist and mixed economies, theory, history, and application of the system in selected countries. **Prerequisite: ECO 223**

### **ECO 373 INTRODUCTION TO ECONOMETRICS 3-0-3**

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 213, ECO 223, MA 253 (Same as FIN 373)**

**ECO 383 INTERNATIONAL ECONOMICS 3-0-3**

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**

**ECO 393 ECONOMIC HISTORY OF THE UNITED STATES 3-0-3**

A survey of major economic developments in American history. Stresses the changed conditions and values in moving from an agricultural to an industrial society.

**Prerequisites: HIS 103, HIS 113 (Same as HIS 393)**

**ECO 453 BUSINESS AND PUBLIC POLICY 3-0-3**

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)

**Prerequisites: MGT 363, ECO 223, LAW 203, MK 203, or permission of the instructor**

**ECO 400X INDEPENDENT STUDIES IN ECONOMICS VARIES (1-4 HRS.)**

Credit earned through directed reading, independent study, research or supervised field work. Maximum 4 hours credit.

**Prerequisite: Permission of Department Chair**

**ECO 5033 MICRO AND MACRO ECONOMIC DECISION MAKING 3-0-3**

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. We will develop analytical models that stress the microeconomic underpinnings of aggregate outcomes and we will apply these models to the recent experience of the US and other countries.

**Prerequisite: Graduate standing or permission from instructor**

**ECO 6223 FINANCIAL MANAGEMENT AND SUSTAINABILITY OF NONPROFIT ORGANIZATIONS**

**(3 HRS.)**

This course will provide the student with an understanding of basic principles of micro-economic analysis, put the nonprofit sector into perspective within the framework of the overall economy, and present strategies for organizational sustainability that incorporate fund development programs, private, corporate and government funding streams. **Prerequisites: All LDR Core (5000-level) courses OR admission to non-degree graduate certificate program**

**EDUCATION**

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Information presented in this catalog is subject to change at any time depending on actions taken by state (IDOE/OELD) and national (CAEP) accrediting agencies. A student will be responsible for meeting any requirements for licensure that are in effect at the time she/he seeks 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.

### **EDU 111 FRESHMAN PRACTICUM 1-0-1**

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. Field experience. **Prerequisite: strong interest in a teacher education major**

### **EDU 211 SOPHOMORE PRACTICUM 1-5-1**

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. Field experience. **Prerequisite: EDU 111; education major**

### **EDU 212 INTRODUCTION TO MUSIC FUNDAMENTALS 2-0-2**

A study of general music fundamentals and methods. There is an emphasis on integrated instruction and the appropriate use of music to enhance the cognitive and psychomotor domains. Open to elementary and HPE majors. **Prerequisite: Benchmark #1**

### **EDU 222 EDUCATIONAL PSYCHOLOGY FOR EARLY CHILDHOOD/MIDDLE CHILDHOOD TEACHERS 2-1-2**

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. Field experience. **Prerequisite: Benchmark #1**

### **EDU 232 EDUCATIONAL PSYCHOLOGY FOR MIDDLE GRADE AND SECONDARY TEACHERS 2-1-2**

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. Field experience.

**Prerequisite: Benchmark #1**

### **EDU 242 PHYSICAL EDUCATION FOR THE ELEMENTARY SCHOOL TEACHER 1-2-2**

Methods of elementary school physical education which meet the developmental needs of children. Focus on curriculum and skill attainment. Field experience in area schools.

### **EDU 301 INTRODUCTION TO TEACHING PRACTICUM 0-5-1**

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. Field experience. **Prerequisite: Benchmark #1; Corequisite: EDU 303**

### **EDU 303 INTRODUCTION TO TEACHING 3-0-3**

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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. **Prerequisite: Benchmark #1; Corequisite: EDU 301**

### **EDU 311 JUNIOR PRACTICUM 1-1-1**

A study of educational programs and practices in schools with multicultural populations and a focus on becoming a culturally responsive teacher. Field Experiences.

**Prerequisite: Benchmark #1**

### **EDU 312 EXCEPTIONAL CHILDREN IN THE SCHOOLS 2-1-2**

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.) Field experience.

**Prerequisite: Benchmark #1**

### **EDU 333 READING IN THE CONTENT AREA 3-1-3**

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. Field experience. Open to secondary and all-grade majors only.

**Prerequisite: Benchmark #2**

### **EDU 342 THE KINDERGARTEN EXPERIENCE 2-1-2**

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 addition to raising awareness for identifying special needs, multicultural issues within the socio-cultural environment are addressed. **Prerequisite: Benchmark #1, EDU 222**

### **EDU 353 CHILDREN'S LITERATURE 3-0-3**

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: Benchmark #1, EDU 301, EDU 303**

### **EDU 412 THE MIDDLE SCHOOL 2-1-2**

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: Benchmark #1, EDU 301, EDU 303**

### **EDU 422 MIDDLE SCHOOL METHODS 2-1-2**

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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. Field experience. **Prerequisite: EDU 412**

### **EDU 432 PRACTICUM IN TEACHING—SECONDARY 0-10-2**

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: Admission to Teacher Education, EDU 301, EDU 303, and department approval**

### **EDU 441 TEACHING OF READING PRACTICUM 0-5-1**

An in-depth study of the responsibilities of teaching reading in an elementary setting. Field experience. Open to elementary majors only. **Prerequisite: Benchmark #2; Corequisite: EDU 445**

### **EDU 442 SPECIAL METHODS FOR THE SECONDARY TEACHER 2-1-2**

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. Field experience.

**Prerequisite: Benchmark #2; Corequisite: EDU 432**

### **EDU 445 TEACHING OF READING 5-0-5**

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: Benchmark #2; Corequisite: EDU 441**

### **EDU 452 ART FOR THE ELEMENTARY TEACHER 2-1-2**

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. Field experience.

**Prerequisite: Benchmark #2**

### **EDU 454 METHODS OF TEACHING MATHEMATICS AND SCIENCE 4-4-4**

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. Field experience.

**Prerequisite: Benchmark #2**

### **EDU 462 EDUCATIONAL MEASUREMENT 2-0-2**

A study of methods of assessment and evaluation that include standardized tests, teacher-made tests, authentic assessment, rubrics, portfolios, performance assessment, informal assessment.

**Prerequisite: Benchmark #2**

**EDU 463 EDUCATIONAL MEDIA AND TECHNOLOGY 2-1-3**

A study of instructional media and technology used in K-12 settings.

**Prerequisite: Benchmark #2**

**EDU 464 METHODS OF TEACHING LANGUAGE ARTS AND SOCIAL STUDIES 4-1-4**

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. Field experience. Open to elementary majors only. **Prerequisite: Benchmark #2**

**EDU 470 SUPERVISED STUDENT TEACHING 1-40-10**

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 10 to 11 full weeks according to subject matter and grade level of planned certification.

**Prerequisites: senior status; 2.5 GPA in major, overall; Benchmark #3; Corequisite: EDU 471**

**EDU 471 STUDENT TEACHING SEMINAR 1-0-1**

Analysis, synthesis, and reflection based on the student teaching experience.

**Prerequisites: senior standing; 2.5 GPA in major, overall; and Benchmark #3; Corequisite: EDU 470**

**EDU 472 PRACTICUM IN TEACHING—MIDDLE 0-10-2**

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, Benchmark #2**

**EDU 473 ISSUES IN AMERICAN PUBLIC EDUCATION 3-0-3**

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: Benchmark #2**

**EDU 400X DIRECTED STUDIES IN EDUCATION VARIES (1-6 HRS.)**

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**

## **ENGINEERING GRAPHICS**

**EGR 143 ENGINEERING GRAPHICS 2-2-3**

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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 153 ENGINEERING GRAPHICS FOR CE 3-0-3**

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 1-4-3**

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**

## **EMERGENCY MANAGEMENT**

### **EM 103 INTRODUCTION TO EMERGENCY MANAGEMENT (3 HRS.)**

This course examines the role of emergency management in today's society. This course will examine the theories, principles and concepts of managing emergencies that impact our communities. The course will address mitigation, preparedness, response and recovery, as well as roles of federal, state and local (public and private) agencies. Analysis and discussion will cover past and present hazards and approaches, and legal issues within the discipline.

### **EM 113 INTRODUCTION TO HAZARD MITIGATION AND PLANNING (3 HRS.)**

This course will examine hazards and hazard mitigation planning. The course will examine causes of and resulting behaviors of hazards and the potential for federal, state and local agencies to mitigate the potential threats presented by hazards. The course will also look at coordination of planning responsibilities of emergency managers as they relate to emergency preparedness and the specialty areas that need to be coordinated.

### **EM 223 RISK ASSESSMENT & VULNERABILITY (3 HRS.)**

An adequate hazard, risk and vulnerability (HRV) analysis is the cornerstone of successful disaster management: communities need to be able to identify potential hazards, to determine those hazards most likely to occur, to evaluate vulnerabilities, and to develop mitigative programs in order to reduce the likelihood and consequences of disasters. Developing an effective implementation of the disaster management plan across disciplinary boundaries will be discussed.

### **EM 253 DISASTER RELIEF & RECOVERY (3 HRS.)**

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.

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Also covered will be the concept of minimizing the occurrences and damages of recurring future events.

### **EM 303 NATURAL AND MAN-MADE DISASTERS (3 HRS.)**

This course will look at natural and man-made disasters across history. An emphasis will be placed on the capabilities and capacities necessary to respond to these disasters. During the course students will explore the evolution of government (federal, state, local & tribal) response through history, with focus on current response trends. Students will explore the roles and responsibilities of public and private entities in response efforts as well as the costs of the roles and responsibilities.

### **EM 313 HAZARDOUS MATERIALS OPERATIONS (3 HRS.)**

This course will cover the dangers posed by hazardous materials to the operations personnel; to the responders; and to the community. Best practices for storage, transportation and use of hazardous materials are covered. Categories and identification of hazardous materials, as well as state and federal laws regulating hazardous materials will be learned.

### **EM 323 HAZARDOUS MATERIALS AND WEAPONS OF MASS DESTRUCTION (3 HRS.)**

The course will explore the use of chemical, biological, radiological, nuclear and explosive (CBRNE) materials as weapons of mass destruction. Students will take a more in depth look at hazardous materials, particularly those that might be used as a weapon. The historical use of CBRNE materials against humanity will be explored. The coordination between law enforcement, fire, health departments, and hazardous materials teams will be addressed during this course. Capabilities and capacities that might be necessary to respond to an incident involving a hazardous material or CBRNE as a weapon of mass destruction will be discussed.

**Prerequisite: EM 313**

### **EM 333 WORLD TERRORISM (3 HRS.)**

This course will examine terrorism around the world and the groups often associated with terrorism. The “lone wolf” as a terrorist will also be explored. Policies and procedures used by countries around the world to prevent and respond to terrorism will be examined. The relative success of these policies and procedures will be evaluated and their potential for implementation in the United States. The course will take up the focus on terrorism in the United States and the consequences this has had on emergency management and the all-hazard approach.

### **EM 343 INCIDENT MANAGEMENT (3 HRS.)**

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 353 HAZARDOUS WEATHER/COMMUNITY RISK (3 HRS.)**

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This course is meant to provide an overview of how weather, climate and natural climatic and geophysical events can create natural disasters for our communities. Threats to human life and property are discussed as well as plans for minimizing the effect of such threats to society. Efforts to control such threats and how to best communicate the danger of the threat will be covered.

### **EM 363 PUBLIC INFORMATION AND MEDIA (3 HRS.)**

This course explores the role of public information in emergency management. The course will address communication with the general public, chief elected officials and senior management, responders, other stakeholders and the media. The course will look at the roles and responsibilities of the various stakeholders in communicating with the various audiences. The role of media in communicating vital information during a disaster will be addressed as well as their impact on response and recovery efforts and public opinion. The role of social media will also be addressed.

### **EM 383 PREPAREDNESS AND RESPONSE OPERATIONS (3 HRS.)**

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 403 MANAGING CONSEQUENCES OF TERRORISM (3 HRS.)**

The history of violence and terrorism, domestic, internationally, and trans-nationally will be reviewed in this course. Hazard analysis, risk assessment and mitigation strategies will be covered. The structure and legal context of anti-terrorism programs, responding to terrorist disasters, and preparedness are all major parts of the course.

### **EM 423 SOCIAL DIMENSIONS OF DISASTER (3 HRS.)**

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.

### **EM 453 EMERGENCY MANAGEMENT CAPSTONE (3 HRS.)**

This course is an overview of the emergency management core courses and will pull the theories, concepts and practices of EM together. Students in this course will work collaboratively to solve simulated disasters in a way that produces the most desirable outcomes to all citizens affected by the simulated disasters. Recovery operations will be stressed. **Prerequisite: All required course work in the emergency management core**

### **EM 503 ADVANCED PRINCIPLES OF EMERGENCY MANAGEMENT (3 HRS.)**

This course prepares the emergency manager to assess, mitigate and manage emergencies that impact our communities in accordance with national standards. Emphasis is placed on the roles of government agencies - local, state, and federal - and the facilitation of strategic plans that

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address unique community situations. A global perspective for emergency management activities is stressed.

**Prerequisite: Must be admitted to either the MSCJ or Certificate Program**

### **EM 513 SEMINAR IN HAZARD MITIGATION (3 HRS.)**

The focus of this course will be to equip emergency managers to address principles of community resilience for both natural and manmade disasters, to implement formal risk assessments, and to involve private sector entities in mitigation strategies. Particular emphasis will be placed on the development and facilitation of a formalized planning process in the successful mitigation of potential hazards.

**Prerequisite: Must be admitted to either the MSCJ or Certificate Program**

### **EM 623 COMPREHENSIVE RISK ASSESSMENT & VULNERABILITY (3 HRS.)**

This is a project-based course that integrated hazard, risk, and vulnerability analyses within a comprehensive disaster management strategy. A focus will be on assisting local communities to assess their unique vulnerabilities and develop policies and processes that mitigate those hazards. Special attention will be placed on maintaining business contingency plans and continuity of operations.

**Prerequisite: Must be admitted to either the MSCJ or Certificate Program**

### **EM 653 MANAGING DISASTER RELIEF AND RECOVERY OPERATIONS (3 HRS.)**

This course is designed to develop competency in damage assessment, disaster declaration, and debris management for both natural and man-made disasters. The focus will be on supervising programs and personnel in accordance with national standards, policies, and procedures, as well as on providing leadership for recovery solutions and future disaster mitigation.

**Prerequisite: Must be admitted to either the MSCJ or Certificate Program**

### **EM 693 EMERGENCY MANAGEMENT DEMONSTRATION PROJECT (3 HRS.)**

An in-depth analysis of the concepts contained within the concentration courses. Conducted under the direction of a criminal justice faculty member and a professional emergency management specialist, 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, one of which has professional emergency management or first responder experience.

**Prerequisite: Must be taken in the final term of the MSCJ or Certificate Program, and may be taken with one other MSCJ course**

## **ENGLISH**

### **ENG 014 ACADEMIC WRITING 4-0-0**

Review and practice of the basic skills and rules necessary for successful academic writing. This is a non-credit preparatory course.

### **ENG 024 ACADEMIC READING 4-0-0**

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Review and practice of the basic skills necessary for successful academic reading. This is a non-credit preparatory course.

### **ENG 034 ENGLISH PREPARATORY INDEPENDENT STUDY 4-0-0**

This is a non-credit preparatory course.

### **ENG 103 ENGLISH COMPOSITION I 3-0-3**

Intensive training in methods of exposition leading to the ability to write coherent, clear, and persuasive essays.

**Prerequisite: Adequate SAT verbal score or ACT English score, class rank, and high school G.P.A., or successful completion of non-credit preparatory English courses.**

### **ENG 104 INTENSIVE ENGLISH COMPOSITION I 4-1-4**

Intensive training in methods of exposition leading to the ability to write coherent, clear and persuasive essays. This course also reviews the major conventions used in writing English. A one-hour weekly lecture will provide a general review of these conventions, along with a one-hour weekly lab to provide further instruction either on an individual or group basis.

**Prerequisite: "C" or better in ENG 024, or adequate SAT Verbal or ACT English score.**

### **ENG 113 ENGLISH COMPOSITION II 3-0-3**

Continuation of ENG 103. Concentration on research paper and library methods.

**Prerequisite: "C" or better in ENG 103 or ENG 104**

### **ENG 133 TECHNICAL COMMUNICATION 3-0-3**

Emphasizes written and oral communication in professional situations for technical fields. Concentration on project-oriented instruction and assessment, which includes creating technical documents (email, reports, proposals, instructions, et. al.) and adapting them to specific audiences and tasks.

**Prerequisite: "C" or better in ENG 103 or ENG 104**

### **ENG 153 INTRODUCTION TO LITERATURE 3-0-3**

Introduces the student to literature of some complexity and sophistication, developing a critical vocabulary and skills in reading on an advanced level. Analysis of genre: short fiction, poetry, and drama.

### **ENG 204 BRITISH LITERATURE 4-0-4**

A survey of British literature to the present. **Prerequisite: ENG 103 or ENG 104**

### **ENG 214 AMERICAN LITERATURE 4-0-4**

A survey of American literature to the present. **Prerequisite: ENG 103 or ENG 104**

### **ENG 233 MYTHOLOGY 3-0-3**

An introduction to world mythology, with emphasis on Greek and Roman legends.

**Prerequisite: ENG 103 or ENG 104**

### **ENG 253 READINGS IN WORLD LITERATURE 3-0-3**

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Readings in selected major works which have influenced thought and culture. Selections may be drawn from (but not limited to) such writers as Dante, Juvenal, Confucius, Montaigne, Rabelais, Cervantes, Moliere, Goethe, and Dostoyevsky.

**Prerequisite: ENG 103 or ENG 104**

### **ENG 263 CONTEMPORARY THEMES IN LITERATURE 3-0-3**

A critical study of works of literature selected for their relevancy to current social, ethnic, minority, and ethical problems. Special emphasis placed upon minority writers.

**Prerequisite: ENG 103 or ENG 104**

### **ENG 273 CREATIVE WRITING 3-0-3**

Directed experiments in the original composition of literary essays, plays, short stories, longer narratives, or poems. **Prerequisite: ENG 103 or 104**

### **ENG 2013 BRITISH LITERATURE I 3-0-3**

A survey of British literature from its beginnings to 1760. **Prerequisite: ENG 103 or 104**

### **ENG 2023 BRITISH LITERATURE II 3-0-3**

A survey of British literature from 1760 to present.

**Prerequisite: ENG 103 or 104**

### **ENG 2113 AMERICAN LITERATURE I 3-0-3**

A survey of American literature from its beginnings to 1890.

**Prerequisite: ENG 103 or 104**

### **ENG 2123 AMERICAN LITERATURE II 3-0-3**

A survey of American literature from 1890 to present.

**Prerequisite: ENG 103 or 104**

### **ENG 303 ADVANCED TECHNICAL COMMUNICATION 3-0-3**

Detailed instruction in proposal and report writing, with an emphasis on writing style, layout and editing. **Prerequisite: ENG 133**

### **ENG 323 RESTORATION AND EIGHTEENTH CENTURY LITERATURE 3-0-3**

A study of literature from 1660-1798. Authors studied include Moliere and Restoration playwrights, Swift, Pope, Voltaire, Dr. Johnson, and others.

**Prerequisite: ENG 103 or ENG 104**

### **ENG 333 STUDIES IN LITERATURE 3-0-3**

Study of selected authors and topics. May be repeated for credit so long as course content is not substantially duplicated.

**Prerequisite: ENG 103 or ENG 104**

### **ENG 363 THE ENGLISH LANGUAGE 3-0-3**

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A systematic study of the development of the English language from its medieval beginnings; some consideration of contemporary dialectic and semantic differences; work with etymology.

**Prerequisite: ENG 113 or ENG 133**

### **ENG 373 LITERARY THEORY 3-0-3**

Introduces major literary theories such as psychoanalytic theory, structuralism, deconstruction, feminism, New Historicism, post-colonialism.

**Prerequisite: ENG 103 or ENG 104**

### **ENG 3303 THE BIBLE AS LITERATURE 3-0-3**

A survey of selections from the Bible with an emphasis on its component genres, literary qualities, and cultural influence. **Prerequisite: ENG 103 or ENG 104**

### **ENG 3313 GRAPHIC NOVELS 3-0-3**

Examines how graphic novels have developed and redefined literature and literacy as concepts.

**Prerequisite: ENG 103 or ENG 104**

### **ENG 403 BRITISH AND AMERICAN NOVELS I 3-0-3**

A chronological study of the major thematic and structural developments in the novel from its beginnings to the 21st century. Social commentary and satire on classes, monarchy, empire, war, education, religion, marriage, middle class morality.

**Prerequisite: ENG 103 or ENG 104**

### **ENG 411 Writing Center Consulting Lab 0-1-1**

Practical experience tutoring writing with the Writing Center. Can be taken up to three times for credit. **Corequisite: ENG 412**

### **ENG 412 Writing Center Consulting 2-0-2**

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 113 or ENG 133; Corequisite: ENG 411**

### **ENG 423 DRAMA 3-0-3**

Studies of selected playwrights, movements, trends, and developments in world drama from the beginnings to the present day. **Prerequisite: ENG 103 or ENG 104**

### **ENG 433 SHAKESPEARE AND HIS TIMES 3-0-3**

The close reading of at least eight plays by Shakespeare. Discussion of his life and times, the sonnets, his themes, and the differences between texts and productions.

**Prerequisite: ENG 103 or ENG 104**

### **ENG 443 POETRY 3-0-3**

An investigation of the poetic process through the careful examination of selected poems and statements about poetry. **Prerequisite: ENG 103 or ENG 104**

### **ENG 453 ADVANCED COMPOSITION 3-0-3**

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An advanced study of the principles of structure and style as applied to the writing of exposition.

**Prerequisite:** ENG 113 or ENG 133

### **ENG 400X DIRECTED STUDIES IN ENGLISH VARIES (1-3 HRS.)**

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 Department Chair

### **ENG 4013 CAPSTONE STUDY IN ENGLISH 3-0-3**

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 Department Chair

### **ENG 4023 SENIOR CAPSTONE INTERNSHIP 3-0-3**

An internship course for students to prepare students for success in graduate studies or a career in technical writing.

**Prerequisite:** Permission of Department Chair

### **ENG 501 RESEARCH AND WRITING SKILLS FOR PROFESSIONAL SUCCESS 3-0-1**

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.

## **ENTREPRENEURSHIP**

### **ENT 303 ENTREPRENEURIAL LEADERSHIP 3-0-3**

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. **Prerequisite:** Junior standing or permission of instructor

### **ENT 313 BUSINESS CONCEPTS (FOR NON-BUSINESS MAJORS) 3 CR**

A survey course designed to introduce non-business majors to business issues and practices. 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, ect.) Not open to student enrolled in the business programs.

### **ENT 323 ENGINEERING CONCEPTS (FOR NON-ENGINEERING MAJORS) 3-0-3**

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:** Junior standing or permission of instructor

### **ENT 333 ENTREPRENEURSHIP SEMINAR SERIES 3-0-3**

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Through case studies, simulations, guest lectures, and reading, students become aware of legal business structures, legal issues related to emerging ventures (patents, copyrights, trademarks, licensing, franchising, employment law, etc.), venture financing, and venture marketing.

**Prerequisite: ENT 313 or 323**

### **ENT 413 CREATIVITY–PRODUCT/SERVICE DEVELOPMENT 3-0-3**

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 or ENT 313**

### **ENT 423 ENTREPRENEURSHIP & VENTURE PLANNING 3-0-3**

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: ENT 413**

### **ENT 463 INTERNSHIP 3-0-3**

Students will be assigned to a real world new venture, small business, or corporate new product development department to gain experience in the art and science of entrepreneurial/entrepreneurial thinking, problem solving, and decision making. The term of the internship will vary depending on the nature of the position and responsibilities. Ideally, students will be assigned the internship during the summer between their junior and senior year.

**Prerequisite: Junior Standing**

### **ENT 6403 FUNDAMENTALS OF FORESIGHT AND ENTREPRENEURSHIP (3 HRS.)**

This course will cover the fundamentals of broad topics in entrepreneurship, including human dimension of entrepreneurship, nature and role of entrepreneurship, economics of entrepreneurship, and corporate entrepreneurship. Students will gain a basic understanding of the entrepreneurial process of venture creation and innovation or the art and skill of finding viable new-business opportunities and the resources needed to develop and profit from them. In addition, students will examine the marketing, management, operations and financial functions needed to successfully start-up a new business whether a sole-proprietorship, partnership or division of a corporation. An emphasis will be placed on foresight, where students will utilize current analytical reports to foresee future events and outcomes, and then acting in accordance so as to arrive at the future in a desired state. They will accomplish this by applying creative and innovative thinking and work as a team to develop new ideas and scenarios around selected contemporary issues.

**Prerequisite: All LDR Core (5000-level) courses OR admission to non-degree graduate certificate program**

### **ENT 6423 FEASIBILITY ANALYSIS FOR NEW VENTURES (3 HRS.)**

The course focuses on business start-ups, providing an intensive introduction to business planning from the defining of a "primary vision" through market size assessment and strategic operations planning, to the financing, staffing and implementation of the new venture. Course includes readings on entrepreneurship, case studies of both small and large examples of

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successful new ventures and student fieldwork. Software available to help business planning will be introduced for hands-on use. Students will each prepare a formal business plan for new ventures. **Prerequisite: All LDR Core (5000-level) courses OR admission to non-degree graduate certificate program**

### **ENT 6443 BUSINESS AND MARKETING PLANS FOR NEW VENTURES (3 HRS.)**

The core of this course provides the theoretical and practical skills required to produce a comprehensive business plan integrating marketing, organizational behavior and financial planning via a flexible corporate strategy and it focuses on marketing planning and emphasizes the analysis of customer needs as well as company and competitor capabilities. This analysis forms the basis of a sound marketing strategy that provides value to customers in a way superior to competitors. Among other topics, students will discuss strategic and managerial analysis and securing start-up financing for new ventures. They will learn how to deliver the marketing strategy through the development of an integrated marketing program covering product offerings, pricing, promotion, and distribution and how to perform presentation of a professional business plan. **Prerequisites: All LDR Core (5000-level) courses OR admission to non-degree graduate certificate program**

### **ENT 6463 ENTREPRENEURSHIP IN A GLOBAL ECONOMY CAPSTONE (3 HRS.)**

This course is designed to provide a capstone or conclusion to the Strategic Foresight and Entrepreneurship Concentration. The emphasis in this course is for students to develop the ability to create and grow a global venture. Students will apply the knowledge and skills acquired in their courses to the work environment using the business plan model. Along with the aspects and characteristics of global entrepreneurs and the global entrepreneurship process, concepts of creativity, innovation and opportunity analysis are discussed both in individual and corporate setting as are global ethics, corporate governance, social enterprise and entrepreneurship. Student will develop a specific business idea, then examine the discussed concepts and include political risk, market opportunity, and operating conditions of their international market destination. Business plan is developed using market research options, entry modes, resource allocation, financial projections, and overall strategy for new ventures. **Prerequisites: All LDR Core (5000-level) Courses and LDR 6403, LDR 6423, LDR 6433, LDR 6443. Students must complete this course last in the MSL Program**

## **ENGINEERING SCIENCE**

### **ES 213 STATICS 3-0-3**

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. **Corequisites: MA 164, PH 224**

### **ES 223 DYNAMICS 3-0-3**

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: Grade of C or better in ES 213, MA 164 and PH 224**

**ES 233 ENGINEERING MATERIALS 3-0-3**

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 104; Corequisite: PH 224**

**ES 243 SOLID MECHANICS 3-0-3**

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**

**ES 253 ELECTRICAL SCIENCE 3-0-3**

Basic voltage-current-energy relationships in circuit elements. Fundamental circuit laws. Resistive networks and network theorems. Sinusoidal steadystate response and phasors. Power and energy in AC circuits. **Prerequisites: MA 134, PH 224**

**ES 313 THERMODYNAMICS 3-0-3**

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: Grade of "C" or better in MA 164, PH 224, and ES 213**

**ES 323 FLUID MECHANICS 3-0-3**

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**

**ES 343 HEAT TRANSFER 3-0-3**

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**

**ES 382 ENGINEERING ECONOMICS 2-0-2**

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**

### **ES 4703 OPERATION MANAGEMENT AND QUANTITATIVE DECISION ANALYSIS 3-0-3**

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)**

## **ENGLISH AS A SECOND LANGUAGE**

### **ESL 0003 GRAMMAR LITERACY**

Students practice the fundamental English skills of reading, spelling, listening, and speaking while focusing on the most basic of grammar points. Students are introduced to singular and plural nouns, pronouns and possessive adjectives, the present and past tense of “be” and the simple present and present progressive tenses.

### **ESL 0012 BASIC VOCABULARY**

Students are introduced to basic vocabulary items from everyday life such as household and classroom items, clothing, days of the week, seasons, numbers, and colors. Students learn to spell and pronounce new words and use them in elementary-level conversations.

### **ESL 002X READING LAB**

The ESL Reading Lab provides ESL students with guided time for sustained silent reading with the major goals of improving their reading comprehension and their reading speed while beginning the process of reading for pleasure. The number of hours varies (1-2 credit hours), and students may take the course multiple times.

### **ESL 0052 BASIC LISTENING**

Beginning students will practice the most basic listening skills to help them understand every day greetings and conversations. They will also practice basic survival language skills such as discussing living situations, communicating with medical professionals, making emergency phone calls, and interacting in public settings, among others

### **ESL 006X SPECIAL TOPICS IN ESL SURVIVAL SKILLS**

This course will be tailored to meet the immediate language learning needs of true beginning-level learners of English. The number of hours will vary (from 1-5 hours), and student may take the course multiple times.

### **ESL 0090 ESL STUDIES**

This is a series of individualized sessions for each student in the ESL program. All ESL students must register for this class every semester until they finish the program. With the consultation of all the students' current instructors, the ESL director will work with each student throughout the semester to identify the individual student's strengths and weaknesses and to advise appropriate courses of action for optimum success at Trine University. This course may be taken multiple

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times, and the final grade for this course will be the average of all current ESL courses. Academic probation may be given on the basis of the grade in this course.

### **ESL 0100 ESL LAB I**

Students use interactive software to improve their basic English skills. This course may be taken multiple times and is graded on a Satisfactory/Unsatisfactory basis.

### **ESL 0103 GRAMMAR I**

Students focus on parts of speech, word order, imperatives, determiners and statements, questions and negation in the present, present progressive, and simple past tenses.

### **ESL 0112 VOCABULARY I**

Students learn to recognize, spell, and pronounce over 2,500 essential vocabulary words for everyday situations. They also practice using new vocabulary words in basic everyday dialogues and conversations.

### **ESL 0123 READING I**

Students learn to use word skills, context clues, and structural clues to determine meaning. Emphasis is placed on main ideas and details of beginning-intermediate reading passages with reading of limited non-prose graphs and charts included. Students demonstrate their skills in written reports, class discussions, presentations, or interviews on outside readings.

### **ESL 0133 WRITING I**

Using their new vocabulary and grammar skills, students learn to write complete sentences with appropriate word order, spelling, and punctuation in the present and past tenses. Students later practice paragraph writing and elementary methods of cohesion.

### **ESL 0141 PRONUNCIATION**

Students practice producing all the sounds of Standard American English along with proper stress and intonation.

### **ESL 0142 PRONUNCIATION & CONVERSATION**

Students practice producing all the sounds of Standard American English along with proper stress and intonation while practicing conversational skills.

### **ESL 0152 LISTENING I**

Students practice listening to and engaging in basic conversations while building a basic vocabulary and verbal and non-verbal conversational skills. Students also learn culturally appropriate social conventions.

### **ESL 016X SPECIAL TOPICS IN ESL SKILLS**

This course will be tailored to meet the immediate language learning needs of ESL (English as a Second Language) students. The number of hours will vary (1-5), and students may take the course multiple times.

**ESL 0201 IRREGULAR VERBS**

Students practice spelling, pronunciation, and usage of over 140 American English irregular verbs. Students learn the parts of the verb and when to use them. In addition, students learn and practice over 120 phrasal verbs and idioms that contain irregular verbs. Emphasis is placed on grammar, writing, test-taking skills, and critical thinking.

**ESL 0203 GRAMMAR II**

Students practice using and understanding simple and progressive forms of present, past, and perfect tenses, the four forms of the future as well as future time clauses, adjectives and adverbs, and basic modal usage.

**ESL 0212 IDIOMS**

Students learn nearly 500 idioms, phrasal verbs, and colloquial expressions and how to use them appropriately in writing and conversation.

**ESL 0223 READING II**

Students learn to use word skills, context clues, and structural clues to determine meaning. Students learn to find main ideas and details of intermediate-advanced reading passages, and they practice non-prose reading such as menus, graphs, tables, charts, and maps. Restatement and inference practice is also provided to help prepare the students for college-level reading assignments. Out-of-class readings with book reports and individual presentations are required.

**ESL 0232 BEGINNING WRITING**

Students practice basic beginning-writing skills which include pre-writing strategies, organization techniques, and how to choose appropriate topics for academic sentences, appropriate detail, sentence combining, transitions, spelling and punctuation.

**ESL 0233 WRITING II**

Students practice basic composition skills such as pre-writing, organization, appropriate topic choices, transitions, main idea sentences, topic sentences, appropriate detail, sentence combining, spelling, and punctuation.

**ESL 0242 SPEAKING II**

Students practice every-day dialogues with formal / informal variations attached to various cultural situations as they continue practicing culturally appropriate social conventions and honing their pronunciation skills.

**ESL 0252 LISTENING II**

Students learn to distinguish and produce American English phonetic sounds, to determine meaning from tone of voice, and to hear and understand idiomatic speech at normal speed with pauses, slurs, and inflections.

**ESL 0303 GRAMMAR III**

Students review all verb tenses and their knowledge of basic modal usage. Students expand their knowledge of auxiliary verbs while learning to form and respond to negative questions and tag questions. Students also learn when to use gerunds and infinitives as well as the passive voice.

**ESL 0312 VOCABULARY III**

Students focus on English-English dictionary use and prefix, suffix, and root word usage. Students learn to use context, word parts, and logic to discover the meaning of unfamiliar words.

**ESL 0323 READING III**

Students practice all reading skills at an advanced level to prepare for college-level reading assignments. Discussion and critical-thinking skills are emphasized. Students also write book reports and give presentations on outside readings.

**ESL 0332 INTERMEDIATE WRITING**

Students strengthen their writing skills by reviewing beginning skills and focusing on coherence devices, multiple support techniques, proper formatting, and avoidance of plagiarism in academic paragraphs. Students learn multiple organizational strategies for descriptive, process, and comparison/contrast paragraphs. They are then introduced to expanding paragraphs into five-paragraph essays.

**ESL 0333 WRITING III**

Students review basic composition skills and focus on more advanced skills such as coherence devices, multiple support techniques, proper formatting, usage of secondary sources, and avoidance of plagiarism. Students also learn appropriate organization for various types of compositions such as comparison/contrast, process, narrative, cause-effect, and persuasive essays.

**ESL 0342 SPEAKING III**

Students practice more advanced conversational skills and learn basic public speaking skills. Students are given various assignments which require interviews with native speakers, presentations for outside audiences, and community service.

**ESL 0343 LISTENING & SPEAKING III**

Students practice listening and responding to advanced conversations, speeches, and academic lectures. Students learn effective note-taking strategies and discuss information from listening exercises. Students are given various assignments which require interviewing native speakers, listening to news broadcasts, and giving informal and formal presentations in class.

**ESL 0352 LISTENING III**

Students practice listening and responding to conversations, speeches, and academic lectures. Students learn effective note-taking strategies and discuss information from listening exercises.

**ESL 0403 GRAMMAR IV**

Students review all verb tenses, the passive voice, and the subjunctive voice. Students also practice modals, conditionals, indirect speech, adjective and noun clauses, and embedded questions. Emphasis is on writing and editing skills.

**ESL 0423 READING & VOCABULARY IV**

Students practice college-level reading skills while enhancing their advanced vocabulary skills. Emphasis is on discussion, critical thinking, and formal presentations.

### **ESL 0432 ADVANCED WRITING**

Students review essential paragraph-writing skills and then focus on the structure of the academic essay. Students review coherence devices, multiple support techniques, proper formatting, and avoidance of plagiarism and then practice citing secondary sources. They learn appropriate organization for academic process, comparison/contrast, cause/effect, and persuasive essays.

### **ESL 0433 WRITING IV**

Students review basic composition skills with a focus on more advanced skills such as coherence devices, multiple support techniques, proper formatting, usage of secondary sources, and avoidance of plagiarism. Emphasis is on appropriate organization for various types of compositions and on research skills.

### **ESL 0443 ADVANCED COMMUNICATION SKILLS**

Students engage in listening and speaking activities which require critical thinking, comprehension from context and tone, academic note taking, listening to and responding to both conversational and academic American English spoken at normal speed, and pronouncing all the sounds of Standard American English with appropriate prosody. Students will also practice giving academic presentations using different technological media about projects which require interacting with English speakers both in and outside the classroom.

### **ESL 0453 ADVANCED CLASSROOM SKILLS**

Students learn effective time management and study skills. They learn about and discuss appropriate classroom etiquette in different cultural settings and how to communicate well with U.S. faculty members. Students also learn effective methods of preparing for and taking academic tests including the TOEFL.

## **ETD - DESIGN ENGINEERING TECHNOLOGY**

### **ETD 101 INTRODUCTION TO ENGINEERING TECHNOLOGY 1-0-1**

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.

### **ETD 103 BASIC TECHNICAL DRAWING 2-2-3**

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 AND TOLERANCING 3-0-3**

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**

**ETD 123 MANUFACTURING MATERIALS AND PROCESSES 3-0-3**

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 CR**

Introduction to the principles of multi-view drawings and the solutions of space problems. Methods for solutions of point, line and plane problems, and the angle between planes, parallelism and perpendicularity, revolution, intersection and development problems.

**Prerequisites: ETD 103**

**ETD 163 ENVIRONMENTAL HEALTH AND SAFETY 3-0-3**

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 studied. Emphasis is placed on concepts and techniques proven useful in reducing accidents and injuries.

**ETD 173 COMPUTER AIDED 3-D MODELING 1-4-3**

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: ETD 103 or EGR 143**

**ETD 203 BASIC MECHANISMS 3-0-3**

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**

**ETD 233 ENGINEERING & MANUFACTURING SYSTEMS 3-0-3**

A study of engineering and manufacturing systems such as engineering documentation systems, design control and lean manufacturing technologies.

**Prerequisites: ETD 173**

**ETD 253 DIMENSIONAL METROLOGY 3-0-3**

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

**ETD 263 DESIGN, ANALYSIS, AND PROTOTYPING 1-4-3**

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

**ETD 273 ELECTRICAL FUNDAMENTALS 3-0-3**

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

**ETD 293 INTRODUCTION TO COMPUTER NUMERICAL CONTROL PRINCIPLES 3-0-3**

History of numerical control and comparison with conventional machining systems. Standard coding systems and control terminology. **Prerequisites:** ETD 123, ETD 173

**ETD 313 DESIGN FOR MANUFACTURE AND ASSEMBLY 3-0-3**

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

**ETD 323 PRODUCT DESIGN AND DEVELOPMENT 3 CR**

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

**ETD 333 STATICS AND STRENGTH OF MATERIALS 3-0-3**

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

**ETD 353 THERMODYNAMICS AND HEAT TRANSFER FOR TECHNOLOGISTS 3-0-3**

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.

**ETD 363 ELEMENTS OF MACHINES 3-0-3**

## Trine University

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, PH 154**

### **ETD 40X SPECIAL PROBLEMS IN ENGINEERING TECHNOLOGY 1-3 HRS.**

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 Department Chair.**

### **ETD 423 SENIOR DESIGN PROJECT 3 CR**

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**

### **ETD 433 COMPUTER NUMERICAL CONTROL PRINCIPLES 2-2-3**

History of numerical control and comparison with conventional machining systems. Standard coding system and control terminology. Job planning and preparation. **Prerequisites: ETD 123 and ETD 263, or permission of instructor.**

### **ETD 463 SENIOR DESIGN PROJECT I 2-2-3**

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**

### **ETD 473 SENIOR DESIGN PROJECT II 1-4-3**

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**

## **EXERCISE SCIENCE**

### **EXS 102 LIFETIME WELLNESS 2-1-2**

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 OF SPORT SKILLS I 3-0-3**

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 majors/minors only.)**

### **EXS 123 TEACHING OF SPORT SKILLS II 3-0-3**

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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.)

### **EXS 131 FIRST AID 1-1-1**

Classroom discussion and practical application of basic first aid principles. American Red Cross certification available.

### **EXS 212 ADAPTIVE PHYSICAL EDUCATION 1-2-2**

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 243 ATHLETIC TRAINING 2-2-3**

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 273 NUTRITION 3-0-3**

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 332 DRUG EDUCATION 2-0-2**

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. **Prerequisite: Junior standing or permission of instructor**

### **EXS 333 KINESIOLOGY 3-0-3**

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**

### **EXS 353 EXERCISE PHYSIOLOGY 3-0-3**

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**

### **EXS 373 HEALTH PROBLEMS 3-0-3**

A theoretical and practical treatment 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.

**Prerequisite: Junior standing or permission of instructor**

### **EXS 383 NUTRITION COUNSELING 3-0-3**

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This class will equip the student with knowledge and an understanding of protocol to give nutrition counseling to a wide range of clients based on their health history and personal wellness and fitness goals.

**Prerequisite: EXS 273**

### **EXS 393 ADVANCED ATHLETIC TRAINING 2-3-3**

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 254, EXS 243**

### **EXS 402 AEROBIC LEADERSHIP (2 HRS.)**

The purpose of the aerobic leadership class is to provide students with the principles and skills necessary to successfully lead activity classes aimed at the wellness goals of improving cardiovascular fitness, muscular strength and endurance, and body composition in the general population. Class instruction includes proper form sequencing, cueing, movement rhythm, and appropriate music selection.

**Prerequisite: Junior standing or permission of instructor**

### **EXS 403 REMEDIAL EXERCISE & REHABILITATION 2-3-3**

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 254, EXS 243, EXS 353**

### **EXS 423 EVALUATION OF ATHLETIC INJURIES 2-3-3**

Specialized course dealing with anatomy, kinesiology, injury symptoms and specific tests to help trainers recognize and evaluate athletic injuries.

**Prerequisites: BIO 254, EXS 243**

### **EXS 433 DEVELOPING HEALTH PROMOTION PROGRAMS FOR ADULTS 3-0-3**

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**

### **EXS 443 THERAPEUTIC MODALITIES 2-3-3**

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 254, EXS 243**

**EXS 451 PRE-CAPSTONE EXPERIENCE IN FITNESS AND EXERCISE SCIENCE (1HRS.)**

A culminating final project, representative of the student's knowledge obtained in the Sports Management department. The project is to exemplify the student's professionalism and familiarity with the subject matter. The analysis is focused on independent study and the development of the student project. **Prerequisite: Junior standing or permission of instructor**

**EXS 452 FITNESS EVALUATION ASSESSMENTS 2-0-2**

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. **Prerequisite: Junior standing or permission of instructor**

**EXS 453 CAPSTONE EXPERIENCE IN FITNESS AND EXERCISE SCIENCE (4HRS.)**

A culminating final project, representative of the student's knowledge obtained in the Sports Management department. The project is to exemplify the student's professionalism and familiarity with the subject matter. The analysis is focused on independent study and the development of the student project. **Prerequisite: Junior standing or permission of instructor**

**EXS 463 MOTOR LEARNING 3-0-3**

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. **Prerequisite: Junior standing or permission of instructor**

**EXS 471 ADANCED GLOBAL PERSPECTIVES HEALTH AND WELLNESS 3-0-3**

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**

**EXS 473 GLOBAL PERSPECTIVES HEALTH AND WELLNESS 3-0-3**

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

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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**

### **EXS 474 INTERNSHIP IN FITNESS AND EXERCISE SCIENCE (4 HRS.)**

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: Junior standing or permission of instructor**

### **EXS 483 INTERNSHIP IN SPORTS MEDICINE (3 HRS.)**

Field experiences involving conference, clinic and workshop attendance. Techniques and practice of written simulation and oral practical applications. Provides opportunity to interact with other allied health practitioners. **Prerequisites: BIO 254, EXS 243, EXS 353**

### **EXS 493 PERSONAL TRAINER CERTIFICATION PREPARATION (3 HRS.)**

The purpose of this class is to prepare the student for the national certification exam by the National Council on Strength and Fitness. Certification is a necessity for a career in health promotion/fitness/strength and conditioning training. The course is designed by the National Council on Strength & Fitness for the specific purpose of preparing students to take their nationally recognized exam. Some of the course objectives are to learn to use evaluation protocols for health related fitness and to teach principles of exercise prescription, health programming and periodization. This class is intensive and should only be taken by graduating seniors in this field. **Prerequisite: Senior standing or permission of instructor**

## **FINANCE**

### **FIN 303 MANAGERIAL FINANCE 3-0-3**

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, ECO 213, ECO 223, MA 253, or permission of the instructor**

### **FIN 323 MONEY AND BANKING 3-0-3**

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 (Same as ECO 323)**

### **FIN 333 PUBLIC FINANCE 3 CR**

This course involves an investigation of the role of the public sector in economic development. Fiscal policy and the practice of public finance are examined. Topics cover cost functions for public goods, externalities, and fiscal federalism. **Prerequisite: ECO 233 (Same as ECO 333)**

### **FIN 343 INTERNATIONAL FINANCE 3-0-3**

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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: FIN 303**

### **FIN 353 PERSONAL FINANCE 3-0-3**

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, cash flow management and budgeting, controlling and managing credit, major purchases decision-making, personal taxes, life and property insurance decision-making, investment basics, retirement planning, and wealth building.

**Prerequisite: MA 103**

### **FIN 373 INTRODUCTION TO ECONOMETRICS 3-0-3**

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 213, ECO 223, MA 253 (Same as ECO 373)**

### **FIN 403 INVESTMENTS 3-0-3**

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**

### **FIN 413 CORPORATE FINANCE 3-0-3**

An analytical approach to financial management of a corporation. Areas covered include: long term financing, financial structure, cost of capital, dividend policy, mergers, reorganization, and international financial management. **Prerequisite: FIN 303**

### **FIN 473 FINANCIAL MODELING 3-0-3**

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**

### **FIN 493 TOPICS IN FINANCE 3-0-3**

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**

**FIN 503 FINANCIAL ANALYSIS FOR DECISION MAKING 3-0-3**

This course reviews the economic and organizational context in which resource allocation decisions are made. Primary tools to be used include spreadsheet analysis, financial simulation, and case studies. Topics to be included are: the capital expenditure decision process, reviewing capital investment projects, capital expenditures, EVA, lease-versus-buy decisions and cash flow analysis. **Prerequisite: Graduate standing or approval of instructor**

**FIN 5063 CORPORATE FINANCE 3-0-3**

This course focuses on the financial management of both publicly held and private corporations. Students are presented with a conceptual framework for understanding and 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: Graduate standing or approval of instructor**

**FIN 6923 MANAGERIAL ACCOUNTING & FINANCE (3 HRS.)**

This course is an introduction and examination of essential accounting and financial 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.

**Prerequisites: All LDR Core (5000-level) courses OR admission to non-degree graduate certificate program**

## FILM

**FLM 203 FILM APPRECIATION 3-2-3**

Acquaints the student with the art of film criticism. Presents basic cinema vocabulary, information about film production, theory and history of film, and practice in analysis of individual films.

## FITNESS

**FIT 2101 WALKING/JOGGING 0-2-1**

Introduction to power walking and the fundamentals of jogging.

**FIT 2111 RACQUET SPORTS 0-2-1**

Introductory look at rules, skills, strategy, and etiquette of tennis, racquetball, badminton, and table tennis.

**FIT 2131 GOLF/BOWLING 0-2-1**

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Introduction to the proper etiquette and fundamentals of golf and bowling. Service fee will be added for course enrollment.

### **FIT 2151 SOCIAL BOARD GAMES 0-2-1**

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 2221 GOLF I 0-2-1**

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.

**Prerequisite: FIT 2131 or permission of instructor**

### **FIT 2271 CONDITIONING 0-3-1**

Development of cardiovascular and strength conditioning. Course will meet three days a week or the equivalent of three hours per week.

### **FIT 2331 INDOOR/OUTDOOR SOCCER 0-2-1**

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 0-2-1**

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 0-2-1**

Introduction to the fundamentals, skills, and rules of karate.

### **FIT 2361 BALL ROOM DANCING 0-2-1**

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 2831 BASKETBALL 0-2-1**

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 400X SPECIAL PROJECTS IN FITNESS VARIES (1-3 HRS.)**

Credit earned through directed reading, independent study, research or supervised lab or field work. Maximum three hours credit.

**Prerequisite: Permission of Department Chair**

## **FORENSIC PSYCHOLOGY**

### **FPY 603 THEORY & PRACTICE OF FORENSIC PSYCHOLOGY (3 HRS.)**

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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**

### **FPY 613 PSYCHOPATHOLOGY (3 HRS.)**

An in-depth analysis of mental illness and its association with criminal behavior, to include identification of patterns of psychopathy and sociopathy and the comparison of disparities and similarities between the two. Various disorders will be examined and applied the causation of crime. This course will also examine the DSM-IV in relation to criminal behavior.

**Prerequisite: Must be admitted to either the MSCJ or Certificate Program**

### **FPY 623 EVALUATION & TREATMENT OF SPECIALIZED POPULATIONS (3 HRS.)**

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**

### **FPY 643 VICTIMOLOGY (3 HRS.)**

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. Criminological theory will be applied to address the reasons that certain victims are more attractive to offenders than others, and to examine a victim's reaction to crime. Prerequisite:

**Prerequisite: Must be admitted to either the MSCJ or Certificate Program**

### **FPY 693 FORENSIC PSYCHOLOGY DEMONSTRATION PROJECT (3 HRS.)**

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: Must be taken in the final term of the MSCJ or Certificate Program, and may be taken with one other MSCJ course**

## **FORENSIC SCIENCE**

### **FS 203 PRINCIPLES OF FORENSIC SCIENCE I 3-0-3**

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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: Forensic Science majors or permission of department chair**

### **FS 213 DIGITAL FORENSIC SCIENCE I 3-0-3**

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 113 or ENG 133, INF 103, INF 183 (FS 213 same as INF 213 and LE 213)**

### **FS 223 PRINCIPLES OF FORENSIC SCIENCE II 3-0-3**

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**

### **FS 343 CRIMINALISTICS AND CRIME SCENE INVESTIGATIONS I 3-0-3**

Introduction to criminalistics and crime scene investigation. Methods of processing a crime scene: documentation, location, and collection of evidence, proper collection and handling procedures, selection and presentation for analytical examination, and presentation of the process and findings in court. **(Same as LE 343)**

**Prerequisite: Junior standing or permission of instructor**

### **FS 351 CRIMINALISTICS AND CRIME SCENE LABORATORY 0-2-1**

A laboratory course which explores the basic techniques of collecting and analyzing evidence taken from crime scenes. **Prerequisite: FS 343 or LE 343 (Same as LE 351)**

### **FS 353 CRIMINALISTICS AND CRIME SCENE INVESTIGATIONS II 3-0-3**

Advanced criminalistics and crime scene investigation. A detailed review of current methodology of collection, processing and court presentation of evidence. Analysis of the roles of law enforcement and forensic scientists. **Prerequisite: FS 343 or LE 343 (Same as LE 353)**

### **FS 373 FORENSIC COMPARATIVE SCIENCE 2-1-3**

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. scenes.

**Prerequisite: Junior standing in Forensic Science or by permission of the department chair**

### **FS 383 FIRE, ARSON, & EXPLOSION INVESTIGATIONS (3 CR.HRS.)**

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An in-depth study of fire, arson, and explosion scene investigation. Emphasis will be placed on the use of the Scientific Method, the principles and techniques of scene preservation and analysis, management of investigation functions, documentation of the scene, and determination of the origin and cause of fires.

**Prerequisite:** CH 144 or CH 104, LE 263 or LE 273

### **FS 422 EXPERT TESTIMONY IN FORENSIC SCIENCE 2-0-2**

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 department chair, SP 203

### **FS 423 PROFESSIONAL PRACTICE IN FORENSIC SCIENCE 3-0-3**

This course will consider the scientist's role in courtroom testimony, communication of scientific data to the general public, courtroom demeanor, trial preparation, and mock trial experiences. Topics pertinent to employment and active participation in the forensic science community will also be discussed.

**Prerequisite:** Senior standing in forensic science program or permission of department chair, SP 203

## **FRENCH**

### **FRN 113 FRENCH 3-0-3**

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.

### **FRN 123 FRENCH II 3-0-3**

A continuation of French 113, integrating listening, speaking, and reading, and writing skills. Basic grammar and French cultures are covered. **Prerequisite:** FRN 113

## **FRESHMAN STUDIES**

### **BA 101 INTRODUCTION TO BUSINESS 1-0-1**

This course is required for all freshman business 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 business degrees. The course will cover community building, academic goals, effective learning methods, University orientation, and personal and professional development.

### **GE 101 INTRODUCTION TO ENGINEERING 1-0-1**

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

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degrees. The course will cover community building, academic goals, effective learning methods, University orientation, and personal and professional development.

### **UE 012 ACADEMIC FOUNDATIONS 2-1-0**

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 1-0-1**

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.

## **GENERAL ENGINEERING**

### **GE 101 INTRODUCTION TO ENGINEERING 1-0-1**

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.

### **GE 113 INTRODUCTION TO ENGINEERING DESIGN 0-6-3**

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 30X ENGINEERING INTERNSHIP (1-3 HRS.)**

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.**

### **GE 313 SPC AND LEAN MANUFACTURING 3-0-3**

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.**

### **GE 401 PROFESSIONAL PRACTICE 1-0-1**

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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: Senior standing in engineering**

### **GE 403 ENGINEERING PROJECT 3 CR**

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 School of Professional Studies and/ or a PE certified faculty member from the school.

### **GE 413 DESIGN OF EXPERIMENTS 3-0-3**

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.

## **GEOGRAPHY**

### **GEO 213 PHYSICAL GEOGRAPHY 3-0-3**

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)**

### **GEO 303 HUMAN GEOGRAPHY 3-0-3**

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**

### **GEO 313 GEOGRAPHY OF NORTH AMERICA 3-0-3**

A regional approach to the United States and Canada. An in-depth look at economic, political, historical, and cultural developments in the context 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**

### **GEO 323 WORLD GEOGRAPHY 3-0-3**

A study of the major cultural regions of the world, with emphasis on human social development (economic, cultural, historical, political), in the context of a given physical environment. Focus is on the present and future of each region, as well as how those futures are intertwined.

**Prerequisite: GEO 303**

### **GEO 343 ECONOMIC GEOGRAPHY 3-0-3**

A spatial approach to economics, the course considers historical, present and future economic activities, developments, and trends, in a global context, with the goal of answering the two basic questions of geography: “where?” and “why there?”. **Prerequisite: ECO 223 (Same as ECO 343)**

### **GEO 353 POLITICAL GEOGRAPHY 3-0-3**

The politics of place. A review of the basic concepts and principles of geopolitics, designed to help students understand the connections between place and political decision-making. The course explores the applications of these concepts using past and present world events, as well as projecting possible futures. **Prerequisite: GOV 113 (Same as GOV 353)**

### **GEO 400X INDEPENDENT STUDIES IN GEOGRAPHY VARIES (1-4 HRS.)**

Credit earned through directed reading, independent study, research or supervised field work. Maximum four hours credit.

**Prerequisite: Permission of Department Chair**

## **GEOLOGY**

### **GLY 271 GEOLOGY LABORATORY 0-1-1**

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: GLY/EAS 273 (same as EAS 271)**

### **GLY 273 GEOLOGY 3-0-3**

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)**

## **GOLF MANAGEMENT**

### **GM 101 INTRODUCTION TO GOLF MANAGEMENT 1-0-1**

This course includes an introduction to university life, time management, study skills, and financial responsibility in addition to exploring the golf industry, career opportunities available, and skills and talents necessary for successful employment in the golf industry.

### **GM 131 PLAYER DEVELOPMENT I 1-0-1**

This course designed to promote game improvement, further explore teaching methodology, and improve technical game skills for Golf Management Majors.

**Prerequisite: Golf Management Major or Minor**

### **GM 203 GOLF SHOP MANAGEMENT 3-0-3**

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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**

### **GM 213 GOLF CLUB DESIGN, REPAIR AND FITTING 3-0-3**

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**

### **GM 223 PROMOTION AND MARKETING OF GOLF FACILITIES 3-0-3**

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 or permission of instructor**

### **GM 231 PLAYER DEVELOPMENT II 1-0-1**

This course designed to promote game improvement, further explore teaching methodology, and improve technical game skills for Golf Management Majors.

**Prerequisite: GM 131**

### **GM 233 INTERSHIP 3-0-3**

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: Sophomore standing or permission of instructor**

### **GM 303 TEACHING THE SHORT GAME 2-0-3**

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: Golf Management Major or Minor**

### **GM 323 TEACHING THE GOLF SWING 3-0-3**

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: Golf Management Major or Minor**

### **GM 331 PLAYER DEVELOPMENT III 1-0-1**

This course designed to promote game improvement, further explore teaching methodology, and improve technical game skills for Golf Management Majors.

**Prerequisite: GM 231**

### **GM 343 GOLF FACILITY OPERATIONS 3-0-3**

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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 or permission of instructor**

### **GM 411 FOOD AND BEVERAGE MANAGEMENT 1-0-1**

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; GM 223 or permission of instructor**

### **GM 431 PLAYER DEVELOPMENT IV 1-0-1**

This course designed to promote game improvement, further explore teaching methodology, and improve technical game skills for Golf Management Majors. **Prerequisite: GM 331**

### **GM 452 GOLF MANAGEMENT LEADERSHIP 2-0-2**

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 411 or permission of instructor**

### **GM 400X RESEARCH TOPICS IN GOLF MANAGEMENT VARIES (1-4 HRS.)**

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.

**Prerequisite: Permission of instructor**

## **GOVERNMENT**

### **GOV 113 INTRODUCTION TO GOVERNMENT 3-0-3**

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.

### **GOV 313 COMPARATIVE GOVERNMENTS 3-0-3**

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: GOV 113**

### **GOV 323 THE CONTEMPORARY WORLD 3-0-3 (Same as HIS 323)**

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. **Prerequisites: GOV 113 or HIS 113**

### **GOV 333 STATE AND LOCAL GOVERNMENT 3-0-3**

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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: GOV 113**

### **GOV 343 AMERICAN POLITICAL THOUGHT 3-0-3 (Same as HIS 343)**

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.

**Prerequisite: GOV 113**

### **GOV 353 POLITICAL GEOGRAPHY 3-0-3**

The politics of place. A review of the basic concepts and principles of geopolitics, designed to help students understand the connections between place and political decision-making. The course explores the applications of these concepts using past and present world events, as well as projecting possible futures. **Prerequisite: GOV 113 (Same as GEO 353)**

### **GOV 363 UNITED STATES FOREIGN POLICY 3-0-3**

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.

**Prerequisites: HIS 103, HIS 113, or GOV 113 (Same as HIS 363)**

### **GOV 373 POLITICAL PSYCHOLOGY 3-0-3**

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.

**Prerequisite: PSY 113 or GOV 113 (Same as PSY 373)**

### **GOV 403 AMERICAN CONSTITUTIONAL DEVELOPMENT 3-0-3**

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.

**Prerequisites: HIS 103, HIS 113, GOV 113 (Same as HIS 403)**

### **GOV 400X INDEPENDENT STUDIES IN GOVERNMENT VARIES (1-4 HRS.)**

Credit earned through directed reading, independent study, research or supervised field work. Maximum 4 hours credit. **Prerequisite: Permission of Department Chair**

## GENERAL STUDIES

### **GS 4003 SENIOR CAPSTONE PROJECT (3 HRS.)**

The capstone project will give students the opportunity to demonstrate the integration of the two to three academic programs they have chosen for the self-directed concentration. The project will include an oral and written presentation encapsulating the rationale for the programs selected and the nature of the relationship between them.

**Prerequisite: Senior standing**

## HEALTHCARE MANAGEMENT

### **HC 303 HISTORY OF AMERICAN HEALTHCARE (3 HRS.)**

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 333 MANAGEMENT TECHNIQUES & PRINCIPLES (3 HRS.)**

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**

### **HC 413 HEALTH CARE ACCOUNTING (3 HRS.)**

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**

### **HC 423 HEALTH CARE FINANCE (3 HRS.)**

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**

### **HC 443 HEALTHCARE DELIVERY SYSTEMS (3 HRS.)**

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

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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 483 PROGRAM AND FACILITIES MANAGEMENT (3 HRS.)**

This course is the culmination of the Health Care Management core and serves as the capstone course. In this course, the student will study and analyze future program options related to healthcare facilities. Management of health care facilities will be studied. Analysis of current programs and facilities and the potential need for programs and/or facilities expansion will be covered. Strategic long-range and tactical short-range planning will be an integral part of this course and will cover both program and facilities planning topics. A comprehensive research project dealing with a health care related case study will be undertaken and presented by the student. The project will include written and oral presentations of the research findings.

**Prerequisites: All other courses in the Health Care Management core should be taken prior to this course.**

### **HC 6803 LEADERSHIP AND MANAGEMENT OF HEALTHCARE SYSTEMS (3 HRS.)**

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**

### **HC 6823 LEGAL AND ETHICAL ISSUES IN HEALTHCARE LEADERSHIP (3 HRS.)**

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 (HIPPA), informed consent, and patient rights and patient advocacy.

**Prerequisites: All LDR Core (5000-level) courses OR admission to non-degree graduate certificate program**

### **HC 6843 ORGANIZATION AND ECONOMICS OF HEALTHCARE DELIVERY SYSTEMS (3 HRS.)**

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**

**HC 6863 HEALTHCARE LEADERSHIP CAPSTONE (3 HRS.)**

This capstone course will provide students the opportunity to integrate and synthesize previous course work 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 MSL Program.

## HIGHER EDUCATION

**HED 6513 STUDENTS AND STAKEHOLDERS IN HIGHER ED. ENVIRONMENT (3 HRS.)**

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**

**HED 6533 TEACHING AND LEARNING IN HIGHER EDUCATION (3 HRS.)**

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**

**HED 6553 PRINCIPLES AND PRACTICES OF ACADEMIC ADVISING (3 HRS.)**

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**

**HED 6573 INSTRUCTIONAL LEADERSHIP CAPSTONE COURSE (3 HRS.)**

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 MSL Program**

## **HISTORY**

### **HIS 103 AMERICAN HISTORY I 3-0-3**

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 3-0-3**

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 3-0-3**

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 3-0-3**

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 1-0-1**

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)**

### **HIS 253 THE JAPANESE PEOPLE 3-0-3**

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 323 THE CONTEMPORARY WORLD 3-0-3**

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.

**Prerequisite: GOV 113 or HIS 113 (Same as GOV 323)**

**HIS 343 AMERICAN POLITICAL THOUGHT 3-0-3**

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.

**Prerequisite: GOV 113 (Same as GOV 343)**

**HIS 353 THE CIVIL WAR & RECONSTRUCTION 3-0-3**

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 GOV 113 (Same as GOV 363)**

**HIS 363 UNITED STATES FOREIGN POLICY 3-0-3**

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.

**Prerequisites: HIS 103, HIS 113, or GOV 113 (Same as GOV 363)**

**HIS 393 ECONOMIC HISTORY OF THE UNITED STATES 3-0-3**

A survey of major economic developments in American history. Stresses the changed conditions and values in moving from an agricultural to an industrial society.

**Prerequisites: HIS 103, HIS 113 (Same as ECO 393)**

**HIS 403 AMERICAN CONSTITUTIONAL DEVELOPMENT 3-0-3**

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.

**Prerequisites: HIS 103, HIS 113, GOV 113 (Same as GOV 403)**

**HIS 423 THE UNITED STATES AS A WORLD POWER 3-0-3**

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. **Prerequisite: HIS 113**

**HIS 433 THE AMERICAN REVOLUTION 3-0-3**

A history of the War of Independence and the formation of national government to 1787.

**Prerequisite: HIS 103**

**HIS 443 READINGS IN AMERICAN HISTORY 3-0-3**

An independent study and research on selected topics in American History. Open to students with departmental approval. **Prerequisite: Junior standing or permission of instructor**

**HIS 453 READINGS IN WORLD HISTORY 3-0-3**

An independent study and research on selected topics in World History. Open to students with departmental approval. **Prerequisite: Junior standing or permission of instructor**

**HIS 400X INDEPENDENT STUDIES IN HISTORY VARIES (1-4 HRS.)**

Credit earned through directed reading, independent study, research, or supervised field work. Maximum 4 hours credit.

**Prerequisite: Permission of Department Chair**

## **HOSPITALITY AND TOURISM MANAGEMENT**

**HOS 103 CURRENT TRENDS IN TOURISM 3-0-3**

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 3-0-3**

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.

**HOS 303 HOSPITALITY AND TOURISM MARKETING 3-0-3**

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: Junior standing or permission of instructor**

**HOS 313 CATERING 3-0-3**

The objective of this class is look at catering from a business perspective including pricing, production, promoting, packaging, and customer service.

**Prerequisite: Junior standing or permission of instructor**

**HOS 322 MEETING AND EVENT PLANNING 2-0-2**

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 a event planning resource notebook and the class project of putting on a "campus event".

**Prerequisite: Junior standing or permission of instructor**

**HOS 402 BEVERAGE MANAGEMENT 2-0-2**

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: a hospitality management major and 21 years of age**

**HOS 404 AND HOS 404L QUALITY FOOD PREPARATION AND LAB 3-2-4**

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 a "A Night out on the Town". Student will exhibit their

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skills by performing a variety of tasks in a cooperative environment as they produce a dining experience to the general public.

**Prerequisite: Junior standing or permission of instructor**

### **HOS 413 CASINO, SPA, AND RESORT MANAGEMENT 3-0-3**

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: Junior standing or permission of instructor**

### **HOS 423 SANITATION AND HEALTH IN THE FOOD SERVICE, LODGING, AND TOURISM INDUSTRY 3-0-3**

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: Junior standing or permission of instructor**

## **HONORS SEMINAR**

### **HNR 121 INTRODUCTION TO HONORS SEMINAR 1-0-1**

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**

### **HNR X1X HONORS HUMANITIES SEMINAR (1-2 HRS.)**

An honors seminar on special topics in the humanities. May be retaken for credit as long as the topics differ.

### **HNR X2X HONORS SOCIAL SCIENCES SEMINAR (1-2 HRS.)**

An honors seminar on special topics in the social sciences. May be retaken for credit as long as the topics differ.

### **HNR X3X HONORS MATHEMATICS/ SCIENCE SEMINAR (1-2 HRS.)**

An honors seminar on special topics in mathematics or science. May be retaken for credit as long as the topics differ.

### **HNR X4X HONORS SEMINAR (1-2 HRS.)**

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.

## HEALTH AND PHYSICAL EDUCATION

### **HPE 202 INTRODUCTION TO ADAPTIVE PHYSICAL EDUCATION 1-2-2**

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 0-2-1**

Knowledge of the rules and officiating practices of sports.

### **HPE 253 RISK MANAGEMENT (3 HRS.)**

Consideration of the legal aspects involved with physical education and sport activities. Emphasis on negligence case law, liability issues and facility safety.

### **HPE 273 NUTRITION (3 HRS.)**

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 342 SCHOOL AND COMMUNITY HEALTH 2-0-2**

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.

**Prerequisite: Junior standing or permission of instructor**

### **HPE 352 FAMILY LIFE EDUCATION 2-0-2**

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**

## HUMAN RESOURCE MANAGEMENT

### **HR 303 COMPENSATION AND BENEFITS (3 HRS.)**

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. **Prerequisite: FIN 303**

### **HR 313 TRAINING AND DEVELOPMENT (3 HRS.)**

Provides a review of the field of training and development, including topics such as adult learning theory, training needs assessment, the design, delivery and evaluation of training and development programs, career development, and e-learning. **Prerequisite: MGT 313**

**HR 323 SAFETY AND HEALTH MANAGEMENT (3 HRS.)**

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.

**Prerequisite: MGT 313 (Equivalent to ETD 163)**

**HR 403 PROJECT MANAGEMENT (3 HRS.)**

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. **Prerequisite HR 323**

**HR 5923 STRATEGIC HUMAN RESOURCE MANAGEMENT (3 HRS.)**

This course is designed to integrate human resource core best practices into a business partnership by analyzing real-world strategic issues in a cohesive framework that leads to the achievement of organizational effectiveness through enlightened HR management and leadership. The course focuses on processes and conceptual issues related to recruitment, selection and staffing. Topics include recruitment and staffing models, policies, and legal compliance as well as practices related to attraction, selection, development, training, retention, and performance management. **Prerequisites: All LDR Core (5000-level) courses OR admission to non-degree graduate certificate program**

**HR 5943 CERTIFIED PROFESSIONAL HUMAN RESOURCES PREPARATION (3 HRS.)**

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 Certified Professional Human Resources certification offered through HR Certification Institute. **Prerequisites: Prerequisites: All LDR Core (5000-level) courses OR admission to non-degree graduate certificate program**

**HR 5953 COMPENSATION AND BENEFIT MANAGEMENT (3 HRS.)**

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**

**HR 5963 HUMAN RESOURCES MANAGEMENT CAPSTONE (3 HRS.)**

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 MSL Program.**

## HUMANITIES

### **HUM 233 SPECIAL TOPICS IN LANGUAGE AND HUMANITIES 3-0-3**

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 401 HUMANITIES PORTFOLIO 3-0-1**

Exploring the relationship of coursework taken in a humanities minor as it relates to human experience, diversity, and communication through a variety of artistic forms.

**Prerequisite: Completion of all other coursework in humanities minor**

## INFORMATICS

### **INF 103 INFORMATION TECHNOLOGY APPLICATIONS 3-0-3**

Terminology, concepts, principles, and use of computer in solutions of business, scientific and educational decision-making problems. Introduction to system structures, storage media, peripheral equipment, communications and Web development. Emphasis on topics in human-computer interaction and human factors, collaborative technologies, ethics, privacy, and ownership of information and information sources, information representation and the information life cycle, the transformation of data to information. Hands on assignments: word processing, spreadsheet analysis, database, presentation graphics, and collaboration software.

**Prerequisite: Computer Literacy**

### **INF 132 INTEGRATED DEVELOPMENT (VISUAL BASIC) 2-0-2**

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 MA 113 or equivalent.**

### **INF 143 INTRODUCTION TO C# 3-0-3**

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 MA 113 or equivalent**

**INF 163 STRUCTURED LOGIC AND DESIGN (C PROGRAMMING) 3-0-3**

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 MA 113 or equivalent.**

**INF 183 INTRODUCTION TO LINUX 3-0-3**

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: INF 103**

**INF 213 DIGITAL FORENSIC SCIENCE I 3-0-3**

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 113 or ENG 133, INF 103, INF 183 (INF 213 same as FS 213 and LE 213)**

**INF 233 ADVANCED SPREADSHEET FOR BUSINESS (3 HRS.)**

Concepts including raw data management, business analysis and reporting. Other concepts include: collaboration and workbook surety, 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 to analyze and communicate business information. **Prerequisite: INF 103 or INF 113**

**INF 263 DATABASE CONCEPTS AND APPLICATIONS 3-0-3**

Concepts including entity-relationship diagrams, normalization to fifth normal form, database optimization. Other concepts include: file organization, data base representation, descriptions, software reliability, security, integrity, relational data bases, query languages. **Prerequisite: INF 103**

**INF 303 NETWORK MANAGEMENT 3-0-3**

Introduction to network management, including concepts and theory of data communications, network design, network security, network management tools, and network management tasks.

**Prerequisites: INF 103**

**INF 311X INFORMATICS INTERNSHIP (1-3 HOURS)**

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 department chair.**

**INF 313 DIGITAL FORENSIC SCIENCE II 3-0-3**

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**

**INF 343 NETWORK SECURITY 3-0-3**

Introduction to network security, including concepts and theory of security policies, access control methods, site security, network security, system security, user security, application security, and managing security functions through cryptographic services, protocols, authentication, authorization, and access control technologies.

**Prerequisite: INF 303**

**INF 371 ADVANCED MICROCOMPUTER LABORATORY 0-2-1**

Students work with both hardware and software components.

**Co-requisite: INF 373**

**INF 373 ADVANCED MICROCOMPUTERS 3-0-3**

Hardware considerations include system board features, memory, hard drive, floppy drives, I/O devices, and comparison of CPU features, CMOS/BIOS firmware. Operating system features, configurations, setup options, multimedia technology, software installation, configuration. Students present PC-related topics.

**Prerequisite: INF 103 and INF 143**

**INF 400X INDEPENDENT RESEARCH IN INFORMATICS (1-3 HOURS)**

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 department chair.**

**INF 403 ADVANCED DATABASE 3-0-3**

Advanced topics for relational and object oriented data base, enhanced query, tables, report features, macros, and Visual Basic applications, relational algebra including RAR modeling. SQL informatics applications development. **Prerequisite: INF 263**

**INF 411X SPECIAL TOPICS IN INFORMATICS (1-3 HOURS)**

Addresses advanced topics in Informatics that vary by year.

**Prerequisite: Junior/Senior standing, and permission of advisor and department chair.**

**INF 413 MOBILE FORENSICS 3-0-3**

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**

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### **INF 433 DATA MINING AND DATA VISUALIZATION 3-0-3**

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 263**

### **INF 443 ADVANCED CYBERSECURITY CONCEPTS 3-0-3**

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**

### **INF 493 INFORMATICS CAPSTONE 3-0-3**

In this course, Informatics majors apply the techniques they have learned in prior course work 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**

## **LAW**

### **LAW 203 BUSINESS LAW I 3-0-3**

This course is an introduction to the American legal system. It includes a survey of courts, legal procedures, torts, and criminal law. It involves an intensive study of 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.

### **LAW 303 BUSINESS LAW II 3-0-3**

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**

### **LAW 313 AUCTION LAW (3 HRS.)**

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**

### **LAW 323 BANKRUPTCY (3 HRS.)**

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**

**LAW 403 EMPLOYMENT LAW 3-0-3**

This course is a survey of the law relating to the employment relationship, with a major emphasis on federal law. The course covers unions and collective bargaining under the National Labor Relations Act. Discrimination in employment will address the Civil Rights Act of 1964 as amended, the Equal Pay Act, the Age Discrimination in Employment Act, the Americans with Disabilities Act, and related statutes. State and federal law with regard to employment-at-will, privacy, whistleblower protection, and related issues will also be discussed.

**Prerequisites: LAW 203, MGT 363**

**LAW 413 INTERNATIONAL LAW 3-0-3**

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**

**LAW 503 PUBLIC POLICY AND THE LEGAL ENVIRONMENT 3-0-3**

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.

**Prerequisite: Graduate standing or approval of instructor**

**LAW 603 ADVANCED EMPLOYMENT LAW (3 HRS.)**

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 either the MSCJ or Certificate Program**

**LAW 613 ADVANCED CRIMINAL PROCEDURE: INVESTIGATION AND ADJUDICATION (3 HRS.)**

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 or Certificate Program**

**LAW 623 CHILDREN AND THE LAW (3 HRS.)**

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 either the MSCJ or Certificate Program**

### **LAW 693 LAW CONCENTRATION DEMONSTRATION CAPSTONE (3 HRS.)**

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: Must be taken in the final term of the MSCJ or Certificate Program, and may be taken with one other MSCJ course**

## **LAW ENFORCEMENT**

### **LE 103 INTRODUCTION TO CRIMINAL JUSTICE 3-0-3**

This course is an introduction to the criminal justice system that covers the processes, institutions and administration of justice in the United States. The course will concentrate on the purposes and history of the three primary parts of the criminal justice system: law enforcement, courts, and corrections.

### **LE 153 JUVENILE JUSTICE 3-0-3**

A comprehensive review of the nature and etiology of juvenile delinquency. The legal and philosophical basis of the juvenile justice process, procedures, and programs of prevention and rehabilitation.

### **LE 213 DIGITAL FORENSIC SCIENCE I 3-0-3**

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 113 or ENG 133, INF 103, INF 183 (LE 213 same as FS 213 and INF 213)**

### **LE 253 PROBATION, PAROLE & COMMUNITY CORRECTIONS 3-0-3**

An introduction to community-based corrections within the criminal justice system. A comprehensive review of the philosophies, and practices, traditional and nontraditional approaches, and exemplary programs of the juvenile, and adult systems.

### **LE 263 INTRODUCTION TO CRIMINAL LAW AND JUSTICE 3-0-3**

A survey of the American criminal justice system, its legal bases, and the interrelationships between local, state and national agencies. Specific attention will be focused on criminal law, criminal liabilities and punishments.

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### **LE 273 CRIMINAL PROCEDURES AND EVIDENCE 3-0-3**

An examination of the various aspects of criminal procedures and their bases in the Constitution and in law. Topics include arrest, search and seizure, interrogation, and the exclusionary rule.

### **LE 313 POLICE ADMINISTRATION 3-0-3**

Historical and legal perspectives of policing in the United States. Issues include: organizational theory, police responsibilities, and leadership roles in contemporary law enforcement organizations. **Prerequisite: LE 103**

### **LE 343 CRIMINALISTICS AND CRIME SCENE INVESTIGATIONS I 3-0-3**

Introduction to criminalistics and crime scene investigation. Methods of processing a crime scene: documentation, location, and collection of evidence, proper collection and handling procedures, selection, and presentation for analytical examination, and presentation of the process and findings in court. **(Same as FS 343)**

### **LE 351 CRIMINALISTICS AND CRIME SCENE LABORATORY 0-2-1**

A laboratory course which explores the basic techniques of collecting and analyzing evidence taken from crime scenes. **Prerequisite: FS 343 or LE 343 (Same as FS 351)**

### **LE 353 CRIMINALISTICS AND CRIME SCENE INVESTIGATIONS II 3-0-3**

Advanced criminalistics and crime scene investigation. A detailed review of current methodology of collection, processing, and court presentation of evidence. Analysis of the roles of law enforcement and forensic scientists. **Prerequisite: LE 343 (Same as FS 353)**

### **LE 363 INSTITUTIONAL CORRECTIONS AND CORRECTIONAL LAW 3-0-3**

A detailed review of penology and institutional corrections. A historical and contemporary perspective on jails and prisons. Rehabilitation and incarceration in both the adult and juvenile systems. A critical analysis of legislation and appellate decisions in correctional law for pretrial detainees and convicted and sentenced prisoners. **Prerequisite: Junior standing or permission of instructor**

### **LE 423 CRIMINAL JUSTICE AGENCY ADMINISTRATION 3-0-3**

A detailed examination of the unique blend of criminal justice and business/public administration required in the administration of law enforcement, judicial and corrections agencies. A pragmatic analysis of public funding and utilization of local, state, and federal grants. **Prerequisite: Junior standing or permission of instructor**

### **LE 433 CRIMINAL JUSTICE CAPSTONE DEMONSTRATION (3 HRS.)**

This capstone course will provide students the opportunity to integrate and synthesize previous course work in Criminal Justice. In addition, to the Capstone Demonstration Project, student will be required to take the Major Field Test for Criminal Justice Majors. **Prerequisite: All required coursework following the Psychology or Law Enforcement Concentration.**

### **LE 453 TOPICS IN CRIMINAL JUSTICE 3-0-3**

Selected topics in the area of criminal justice. **(May be taken multiple times.)**  
**Prerequisite: Junior standing or permission of instructor**

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### **LE 473 LAW ENFORCEMENT INTERNSHIP I (3 HRS)**

Professional internship placement in a criminal justice agency in the students' areas of concentration. Students will participate in agency activity under the supervision of an agency professional.

**Prerequisite: Junior or senior standing and department approval**

### **LE 483 LAW ENFORCEMENT INTERNSHIP II (3 HRS.)**

Students with a double concentration or double major may enroll in a second professional internship placement. **Prerequisite: Double concentration in criminal justice or double major, junior/senior standing, and department approval**

### **LE 493 FORENSIC/CORRECTIONAL INTERNSHIP (3 HRS.)**

Field experience in diagnostic correctional settings or facilities.

**Prerequisite: Junior standing or permission of instructor**

### **LE 400X INDEPENDENT STUDIES IN CRIMINAL JUSTICE VARIES (1-4 HRS.)**

Original research and/or a review of current, critical research on an approved topic within the student's field of concentration.

**Prerequisite: Junior or senior standing and department approval (course may be repeated)**

### **LE 4015 BASIC POLICE TRAINING COURSE (15 HRS.)**

Attendance and completion of the Basic Police Training Course at the Indiana Law Enforcement Academy.

**Prerequisite: Junior or senior standing and department approval**

## **LEADERSHIP**

### **LDR 203 LEADERSHIP STRENGTHS AND SKILLS (3 HRS.)**

This course focuses on a strengths-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.

### **LDR 303 CONTEMPORARY LEADERSHIP THEORY AND PRACTICE (3 HRS.)**

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.

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### **LDR 403 CREATIVITY, INNOVATION, AND INFLUENCE (3 HRS.)**

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 they can use to facilitate innovation in individuals, groups, organizations, and communities.

### **LDR 433 LEADERSHIP PRACTICUM (3 HRS.)**

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 5003 LEADERSHIP PHILOSOPHY (3 HRS.)**

An exploration of the nature of leadership models and theories, examining these models through a broad variety of insights and viewpoints. Provides a description and analysis of these approaches to leadership, giving special attention to how the models can improve leadership in the real-world organization. **Prerequisites: none**

### **LDR 5023 STRATEGIC LEADERSHIP (3HRS.)**

A study of the formulation of strategy and policy in the organization, emphasizing the integration of strategic decisions across the functional areas and across multiple business units. Significant emphasis is placed on the critical role that leaders play in driving organizational success while concurrently ensuring ethical soundness.

**Prerequisites: None**

### **LDR 5043 ORGANIZATIONAL SYSTEMS AND CULTURES (3 HRS.)**

This course will equip students to fully understand the complexities of organizational systems and cultures, the ways in which these forces manifest themselves, and the means by which leaders intentionally impact the shape that these forces take in their organizations. Students will explore the application of various organizational systems and cultures theories to case studies, as well as to their current professional settings. Additionally, students will research and critically analyze the comparative cultures of two organizations from the same industry. The findings related to this research will be presented in the form of an Executive Presentation and related written analysis report. **Prerequisites: LDR 5003, LDR 5023**

### **LDR 5062 ORGANIZATIONAL DEVELOPMENT AND CHANGE (2 HRS.)**

An exploration of the behavioral forces and relationships that influence organizational effectiveness and change. Topics include the study of intervention strategy and application skills. **Prerequisites: LDR 5003, LDR 5023**

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### **LDR 5083 CONFLICT RESOLUTION FOR LEADERS (3 HRS.)**

Conflict is a fact of everyday professional and personal life. If conflict is mishandled, it can be a source of considerable stress and lead to lost productivity. Much of the success and satisfaction we find in life is determined by how we respond to conflict. Leaders especially must respond well in conflict situations and should willingly accept the consequences of their conflict responses. This course explores theories, methods, skills, and practices associated with successfully engaging in the dynamics of conflict interactions. **Prerequisites: LDR 5003, LDR 5023**

### **LDR 5203 LEADERSHIP ETHICS, CULTURE, AND POLITICS (3 HRS.)**

This course compares and contrasts the disciplines of leadership with an emphasis on fostering organizational culture and personal ethics. Topics will include historical and contemporary leadership theories applied across a wide variety of organizational contexts. **Prerequisites: LDR 5003, LDR 5023**

### **LDR 5223 ORGANIZATIONAL COMMUNICATIONS FOR LEADERS (3 HRS.)**

This course is designed to examine the theoretical and applied literature in the field of organizational communication relevant to organizational leadership. The different perspectives on organizational theory — the classical, systems approach, cultural, etc. — will be studied and compared. In addition, such applied topics as organizational socialization, conflict, and the impact of technology on organizational communications will be investigated. **Prerequisites: LDR 5003, LDR 5023**

### **LDR 5333 QUALITATIVE DECISION MAKING (3 HRS.)**

This course will provide the students with statistical tools and techniques that will enable them to make an immediate impact in their careers. Additionally, it presents an overview of the various primary and secondary research methodologies used in the financial world and the application of statistical techniques to those strategies. This course will be realistically oriented and numerous business examples and cases will be analyzed. This course is a prerequisite LDR 5863 and students will be formulating analytical research methods, problem statement, and capstone proposal.

**Prerequisites: Prerequisites: All LDR Core (5000-level) courses OR admission to non-degree graduate certificate program**

## **MATHEMATICS**

### **MA 0304 INDIVIDUALIZED ALGEBRA 4-0-0**

**(For non-traditional students.) This is a non-credit, preparatory class.**

### **MA 033 ELEMENTARY ALGEBRA 3-0-0**

Topics include: basic Algebra, signed numbers, polynomial rational expressions, factoring, linear equations, graphs, linear systems. This is a non-credit, preparatory class.

### **MA 0404 INDIVIDUALIZED INTERMEDIATE ALGEBRA 4-0-0**

**(For non-traditional students.) This is a non-credit, preparatory class.**

**Prerequisite: Equivalent of high school Algebra I**

**MA 043 INTERMEDIATE ALGEBRA 3-0-0**

Topics include: rational algebraic expressions, exponents, radicals, linear systems, functional notation, graphs. This is a non-credit, preparatory class.

**Prerequisite: Adequate SAT/ACT Mathematics score.**

**MA 103 BUSINESS ALGEBRA 3-0-3**

This course emphasizes the business applications of the following: rational algebraic expressions, quadratic equations, linear systems, synthetic division, determinants, exponents, radicals, and logarithms. **Prerequisite: Adequate SAT/ACT Mathematics score or approval from mathematics department chair.**

**MA 113 COLLEGE ALGEBRA 3-0-3**

Topics include: rational algebraic expressions, quadratic equations, non-linear systems, partial fractions, binomial expansion, synthetic division, determinants, exponents, radicals, logarithms.

**Prerequisite: Adequate SAT/ACT Mathematics score or approval from mathematics department chair.**

**MA 123 TRIGONOMETRY 3-0-3**

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.**

**MA 124 PRE CALCULUS 4-0-4**

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.**

**MA 134 CALCULUS I 4-0-4**

Topics include: limits, continuity, differentiation, applications, definition of the integral, and fundamental theorem of integral calculus. Uses symbolic algebra software.

**Prerequisite: Three years of high school mathematics, including trigonometry, and adequate SAT/ACT Mathematics score or approval from mathematics department chair.**

**MA 153 FINITE MATHEMATICS 3-0-3**

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**

**MA 164 CALCULUS II 4-0-4**

Topics include: applications of integration, differentiation, and integration of transcendental functions and methods of integration, L'Hopital's rule, conic sections, parametric equations, polar coordinates, infinite series. Uses symbolic algebra software.

**Prerequisite: "C" or better for MA 134 or equivalent**

**MA 173 APPLIED MATHEMATICS 3-0-3**

Topics include: Mathematics of finance, graphical solution of linear programming problems, introduction to differential and integral calculus with applications.

**Prerequisite: MA 113 or MA 113**

**MA 184 MATHEMATICS FOR ELEMENTARY TEACHERS I 4-0-4**

Topics include: numeration systems, set theoretic development of whole number system, decimals, percent's, ratios, elementary number theory, elementary algebra, problem solving techniques. Designed specifically for elementary and middle school curricula emphasizing NCTM standards.

**MA 194 MATHEMATICS FOR ELEMENTARY TEACHERS II 4-0-4**

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**

**MA 203 DISCRETE MATHEMATICS FOR INFORMATION SCIENCES 3-0-3**

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 103 or MA 113**

**MA 213 CALCULUS III 3-0-3**

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 3-0-3**

Topics include: methods of solution for first and higher order differential equations, systems of ordinary differential equations, Laplace transforms, series solutions. **Prerequisite: MA 213**

**MA 253 STATISTICS 3-0-3**

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 103 or MA 113**

**MA 273 CRYPTOGRAPHY & COMPRESSION 3-0-3**

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**

**MA 303 COLLEGE GEOMETRY 3-0-3**

Topics include: axiomatic development of Euclidean geometry, constructions, geometric transformations, introduction to non-Euclidean geometry. **Prerequisite: MA 164**

**MA 312 HISTORICAL ASPECTS OF MATHEMATICS 2-0-2**

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**

**MA 313 LINEAR ALGEBRA 3-0-3**

Topics include: vectors spaces, determinants, subspaces, bases, transformations, and mappings. Theory and applications of matrix algebra. **Prerequisite: MA 213**

**MA 323 OPERATIONS RESEARCH 3-0-3**

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: INF 143 or CS 1113; MA 253 or MA 393**

**MA 333 NUMBER THEORY 3-0-3**

Topics include: divisibility, prime numbers, Euclid's algorithm, linear congruences, quadratic residues. Numerical functions, factorization, Fibonacci numbers, Diophantine equations, applications, puzzles. **Prerequisite: MA 164**

**MA 343 SETS AND LOGIC 3-0-3**

Topics include: sets, set operations, methods of proof, induction, truth tables, relations, symbolic logic, real number system considerations, elementary combinatorics. **Prerequisite: MA 164**

**MA 353 VECTOR ANALYSIS 3-0-3**

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**

**MA 363 ADVANCED DIFFERENTIAL EQUATIONS 3-0-3**

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**

**MA 373 ABSTRACT ALGEBRA 3-0-3**

A study of fundamental algebraic structures emphasizing groups, rings, integral domains and fields. Homomorphism and isomorphism perspectives. **Prerequisite: MA 313**

**MA 383 COMPUTER SOLUTIONS TO DIFFERENTIAL EQUATIONS 3-0-3**

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**

**MA 393 PROBABILITY AND STATISTICS 3-0-3**

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**

**MA 300X TOPICS IN MATHEMATICS (VARIES)**

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.**

**MA 403 ADVANCED CALCULUS 3-0-3**

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: MA 213 and junior/senior standing**

**MA 423 COMPLEX VARIABLES 3-0-3**

Topics include: complex numbers and functions, analytic functions, Cauchy-Riemann equations, conformal mapping. Cauchy theory, Taylor and Laurent series, calculus of residues, Dirichlet and Neumann problems, Poisson integral formula, and analytic continuation.

**Prerequisite: MA 233 and Junior/Senior standing**

**MA 433 AN INTRODUCTION TO MATHEMATICAL CRYPTOGRAPHY 3-0-3**

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**

**MA 443 NUMERICAL ANALYSIS 3-0-3**

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**

**MA 473 GRAPH THEORY AND COMBINATORICS 3-0-3**

An introduction to discrete and combinatorial mathematics. Construction and analysis of mathematical models using combinatorics, graph theory and other discrete methods with application in a wide variety of areas.

**Prerequisite: MA 213**

**MA 400X SPECIAL PROBLEMS IN MATHEMATICS (VARIES, 1-3 HRS.)**

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: Senior standing** (See Chair for independent study policy)

## **MECHANICAL & AEROSPACE ENGINEERING**

### **MAE 203 MECHANICAL ENGINEERING ANALYSIS 2-2-3**

An introduction to analytical and numerical methods of solving mechanical engineering problems. Programming in MATLAB. An introduction to various topics of mechanical engineering. Lecture focuses on the interrelationship between mathematics, natural sciences, and engineering design.

**Prerequisite: MA 134, Corequisite: EGR 143**

### **MAE 243 MANUFACTURING PROCESSES AND EQUIPMENT 2-2-3**

An examination of commonly used engineering materials and the manufacturing processes and machines used in processing these materials. Demonstrations of: sand molding, metal casting, metal removal processes (turning, milling, drilling, grinding), and deformation processes. Introduction to CNC machining.

**Prerequisites: ES 233, Corequisite ES 243**

### **MAE 303 MECHANICS OF MACHINERY 3-0-3**

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 323 THERMODYNAMICS II 3-0-3**

Gas power systems: air-standard cycles, gas turbines. Refrigeration and heat pump systems. Non-reacting ideal gas mixtures and psychrometrics. Reacting mixtures and combustion. Compressible flow. **Prerequisite: ES 313**

### **MAE 333 FLUID MECHANICS II 3-0-3**

Topics include: surface resistance, wall shear stress, and boundary layer flow, internal flow, laminar, and turbulent flow in conduits, external flow, drag, and lift, compressible flow, normal shock waves, isentropic flow through nozzles and diffusers. Introduction to turbomachinery. (Through Spring 2013)

**Prerequisites: ES 223, ES 313, ES 323, MA 233**

### **MAE 343 MANUFACTURING PROCESSES AND EQUIPMENT 2-2-3**

An examination of commonly used engineering materials and the manufacturing processes and machines used in processing these materials. Demonstrations of: sand molding, metal casting, metal removal processes (turning, milling, drilling, grinding), and deformation processes. Introduction to CNC machining. **Prerequisites: ES 233, ES243**

### **MAE 353 MACHINE COMPONENT DESIGN 3-0-3**

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**

**MAE 363 INTRODUCTION TO MECHATRONICS 2-2-3**

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 223**

**MAE 363H HONORS INTRODUCTION TO MECHATRONICS 2-2-3**

A self-paced, project-oriented course studying the use of electronics and microprocessors to control mechanical devices. Introductory projects include material such as 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. Students are also required to complete a major robotics design project and are encouraged to enter a national competition. **Prerequisite: ES 253 or ECE 223**

**MAE 373 COMPUTER-AIDED MACHINE DESIGN 1.5-3-3**

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.

**Corequisite: MA 313, Prerequisites: EGR 143 and ES 243**

**MAE 383 METALLURGICAL THERMODYNAMICS 3-0-3**

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**

**MAE 393 METALLURGICAL TRANSPORT PROCESSES 3-0-3**

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**

**MAE 3033 FLUID DYNAMICS FOR MECHANICAL ENGINEERING 3-0-3**

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, and MAE 203**

**MAE 413 THERMO-FLUID COMPONENT DESIGN 3-0-3**

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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 423 HEATING, VENTILATING, AND AIR CONDITIONING 3-0-3**

Topics include: design of heating, ventilating, and air conditioning (HVAC) systems for buildings. Heat conduction in buildings. Convection and infiltration. Radiation and solar insolation loads. Psychrometry and thermal comfort. Heating and cooling load calculations. Particular attention will be paid to the HVAC needs of industrial firms and commercial installations. **Prerequisites: ES 333 or MAE 3033, MAE 323**

### **MAE 443 ENGINEERING METALLURGY 2-2-3**

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**

### **MAE 453 MECHANICAL VIBRATION 3-0-3**

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**

### **MAE 463 MEASUREMENT LABORATORY 1-4-3**

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, MA 393, MAE 353**

### **MAE 473 APPLIED AERODYNAMICS 3-0-3**

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 333 or MAE 3033 and MAE 323**

### **MAE 483 VEHICLE STRUCTURES 3-0-3**

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**

### **MAE 493 AERODYNAMICS LABORATORY 1-4-3**

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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**

### **MAE 400X SPECIAL PROBLEMS IN MECHANICAL ENGINEERING VARIES (1-6 HRS)**

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**

### **MAE 4023 SYSTEM DYNAMICS AND CONTROLS 2-2-3**

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**

### **MAE 4053 MECHANICAL ENGINEERING DESIGN I 2-2-3**

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 373, ES 313**

### **MAE 4063 MECHANICAL ENGINEERING DESIGN II 1-4-3**

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**

### **MAE 4123 POWER GENERATION 3-0-3**

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**

### **MAE 4133 INTERNAL COMBUSTION ENGINES 3-0-3**

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**

### **MAE 4143 PHYSICAL METALLURGY 2-2-3**

Course explores the underlying structure-property relationships of metals. Topics include: thermodynamics and kinetics of phase transformations, diffusion, dislocation behavior,

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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**

### **MAE 4173 GAS TURBINES 3-0-3**

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 333 or MAE 3033 and 323**

### **MAE 4183 AIRCRAFT STABILITY AND CONTROL 3-0-3**

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**

### **MAE 4193 METAL CASTING 2-2-3**

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 343 or consent of instructor**

### **MAE 500X SPECIAL TOPICS**

Topic(s) to be jointly selected by the student(s) and the instructor. May be retaken for credit if the topic is substantially different.

**Prerequisite: Graduate standing or consent of department chair.**

### **MAE 5213 ADVANCED HEAT TRANSFER 3-0-3**

Analytical and numerical methods in steady and unsteady conduction and convection. Convection with phase change. Use of commercial software for numerical analysis of heat transfer problems. As time permits, radiation heat transfer and mass transfer.

**Prerequisite: Graduate standing in mechanical engineering or consent of instructor**

### **MAE 5223 INTRODUCTION TO COMPUTATIONAL FLUID MECHANICS 3-0-3**

Fluid kinematics, integral analysis of the conservation equations. Differential analysis of fluid flow. Approximate solution of the Navier-Stokes equations. Introduction to computational fluid dynamics (CFD). Laminar CFD calculations. Turbulent CFD calculations. CFD with heat transfer.

**Prerequisite: Graduate standing in mechanical engineering or consent of instructor**

### **MAE 5433 MECHANISM SYNTHESIS 3-0-3**

Analytical synthesis of planar linkages for function, path and motion generation. Dynamic analysis of joint forces in planar mechanisms. Synthesis of rigid and compliant cam and follower systems. **Prerequisite: Graduate standing in mechanical engineering or consent of instructor**

### **MAE 5473 SYSTEM DYNAMICS AND CONTROL 3-0-3**

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

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transforms. The development of time constants, damping ratios, transfer functions, poles and zeros, mode functions, and frequency-response functions. The application of feedback modeling and design tools including root-locus diagrams, Bode plots, and PID control.

**Prerequisite: Graduate standing in mechanical engineering or consent of instructor**

### **MAE 5543 ADVANCED MACHINE DESIGN 3-0-3**

Design of machine elements with an emphasis on uncertainty. Statistical descriptions of material properties. Limits and fits, dimensions and tolerances, and the propagation of error. Effect of uncertainty in theories of failure for both static and fatigue loading. Design for reliability. Application to selected machine elements.

**Prerequisite: Graduate standing in mechanical engineering or consent of instructor**

### **MAE 5583 DESIGN OF EXPERIMENTS 3-0-3**

Design and statistical analysis of engineering experiments with a focus on process optimization and robust product design. Single factor and multi-factor experimental design and analysis. Taguchi methods are discussed including the application of signal-to-noise ratio, and orthogonal arrays. **Prerequisite: Graduate standing in mechanical engineering or consent of instructor**

### **MAE 5663 MATERIALS FAILURE ANALYSIS 3-0-3**

A study of the mechanisms of materials failure, failure analysis techniques, and non-destructive testing methods. Emphasis is placed on the analysis and interpretation of case studies. Fracture mechanics, fatigue, environmental influences, and manufacturing influences on failure are all addressed. Practical laboratory work with the scanning electron microscope and with optical microscopes serves to illustrate and reinforce key concepts in fractography.

**Prerequisite: Graduate standing in mechanical engineering or consent of instructor**

### **MAE 5753 COMPUTER INTEGRATED MANUFACTURING 3-0-3**

Computer-assisted process planning and estimating. Concepts of computer control and feedback mechanisms. Design considerations for machine tools, machining cells, robotics, and flexible manufacturing systems.

**Prerequisite: Graduate standing in mechanical engineering or consent of instructor**

### **MAE 600X MECHANICAL ENGINEERING GRADUATE PROJECT (VARIES 1-6 HRS.)**

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 per credit hour. Students should choose the number of credits each semester based on the amount of time they expect to spend on the project. **Prerequisite: Graduate standing in Mechanical Engineering or consent of department chair.**

## MANAGEMENT

### **MGT 313 HUMAN RESOURCES MANAGEMENT 3-0-3**

This course includes a discussion of policies, objectives, principles and organizational structure as they pertain to personnel work. The major activities of a personnel department such as recruiting, selecting, training, and employee relations are examined along with the impact of government laws and regulations on these activities.

**Prerequisite: Junior standing or permission of instructor**

### **MGT 323 LEADERSHIP 3-0-3**

This course examines leadership, influence, and power across a variety of disciplines, with a strong emphasis on ethics. Historical, literary, and contemporary examples of successful leaderships provide a framework for examining the theories and practice of leadership and power. **Prerequisite: Junior standing or permission of instructor**

### **MGT 333 SUPERVISION 3-0-3**

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: MGT 363**

### **MGT 343 HUMAN RESOURCE DEVELOPMENT 3-0-3**

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: Junior standing or permission of instructor**

### **MGT 353 DESIGNING OPERATIONS 3-0-3**

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 or permission of instructor**

### **MGT 363 ORGANIZATIONAL BEHAVIOR 3-0-3**

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.

**Prerequisites: COM 213, PSY 113, or permission of instructor**

### **MGT 413 MANAGEMENT OF QUALITY 3-0-3**

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.

**Prerequisite: MGT 353, MA 253, or permission of instructor**

**MGT 443 MANAGING OPERATIONS 3-0-3**

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.

**Prerequisite: MGT 353 and MA 253 or permission of instructor**

**MGT 453 STRATEGIC MANAGEMENT 3-0-3**

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: Completion of all business core courses or permission of the dean of the Ketner School of Business**

**MGT 463 SMALL BUSINESS MANAGEMENT 3-0-3**

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: AC 213, MK 203, FIN 303, MGT 353, MGT 363**

**MGT 473 CAPSIM BUSINESS SIMULATION 3 CR**

This course through competitive simulations, will teach the importance of team work, strategic planning and the impact of decision-making within a business entity. Small teams will manage a business entity throughout the course. Teams will make and submit decisions regarding functional areas of the entity, including research and development, production, marketing, finance, and human resources. The decisions will then be analyzed and feedback given on how the decisions would have impacted the entity. Teams will be competing with other teams across the globe, and they will see immediately how their decisions position their given entity in the global business arena. **Prerequisites: Completion of all business core courses or permission of the dean of the school of Professional Studies.**

**MGT 483 CAPSTONE 3 CR**

This capstone course will provide students with the opportunity to integrate and synthesize previous course work in business to complete a primary research project. Students will identify a problem, research potential solutions and survey impacted groups. By analyzing the data collected, the student will complete a report and make recommendations. The final report will be presented. This course is the capstone business course and should be taken the semester before graduation. **Prerequisites: Completion of all business core courses or permission of the dean of the school of Professional Studies.**

**MGT 493 SELECTED TOPICS 3-0-3**

Offered to treat specific or current business or management issues in depth.

**Prerequisites: MGT 353, MGT 363 or permission of the instructor and the dean of Ketner School of Business**

**MGT 523 COMMUNICATIONS, LEADERSHIP AND ETHICS 3-0-3**

This course examines leadership, influence, and power across a variety of disciplines with a strong emphasis on ethics. Historical, literary, and contemporary examples of successful leadership provide a framework for examining the theories and practice of leadership and power. This course requires substantial advanced critical thinking and writing.

**Prerequisite: Graduate standing**

**MGT 543 OPERATIONS STRATEGY AND MANAGEMENT 3-0-3**

This course examines the central role of operations in both manufacturing and service enterprises. Topics include quality management, design of goods and services, layout, scheduling, project management, inventory management, supply chain management, and purchasing activities within the firm.

**Prerequisite: Graduate standing**

**MGT 5093 BUSINESS STRATEGY AND DECISION-MAKING 3-0-3**

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: Graduate standing**

**MGT 6003 FUNDAMENTALS OF INTERNATIONAL BUSINESS LEADERSHIP (3 HRS.)**

This course provides students with a practical but intellectually challenging roadmap to their development as international business leaders. Different challenges and insights provided by leaders from industry and government enable students to explore leadership as a concept and as a vocation. Students will understand the dynamics of the worldwide marketplace, evaluate the different dimensions of international business, and examine leadership traits and skills managers must possess to effectively lead in rapidly expanding and volatile global economy. They will study management practices of global leaders while identifying the drivers of international business. Students will learn how to recognize and how to work through many of the barriers, challenges, and differences of international business to become global leaders. **Prerequisites: All LDR Core (5000-level) courses OR admission to non-degree graduate certificate program**

**MGT 6023 INTERNATIONAL MARKETING AND ECONOMICS FOR LEADERS (3 HRS.)**

Culture, economic arrangements, technical standards, currency movements, language, religion, ideology, politics, distance and conflicting interpretations of national and global interests combine to complicate the administration of marketing's familiar 4-Ps cross-nationally. This course uses a combination of lectures, global marketing cases, discussion, and mini projects to

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examine specific issues currently involved in multinational marketing strategies. In addition, students will study the concepts of international finance (international monetary relations) and financial policies, international loans, balance of payments accounting, exchange rates, reserve and payments currencies, and international liquidity. Of particular interest is the impact of the U.S. economy of international financial developments. Balance of payments adjustment under fixed and flexible exchange rates and under the gold standard will be considered in detail. **Prerequisites: All LDR Core (5000-level) courses OR admission to non-degree graduate certificate program**

### **MGT 6043 GLOBAL LOGISTICS & SUPPLY CHAIN MANAGEMENT FOR LEADERS (3 HRS.)**

This course demands from students to develop cutting-edge logistics strategies to gain competitive advantage and a comprehensive understanding of managing logistics in a global setting. It covers principles of logistics activities in international business with special emphasis on transportation, global sourcing, customs issues, import-export opportunities, customs documentation, and the role of government in international transactions, customer service, information technology, and global supply chain management. Special emphasis is placed on current events and their effect on the marketing and logistics activities of global organizations. Students will evaluate the advantages and disadvantages of the location of different facilities in a global context, and the tangible and intangible resources required for effective supply chain decision making. They will coordinate logistics activities across supply chains and choose between different options for effectively delivering logistics services. **Prerequisites: All LDR Core (5000-level) courses OR admission to non-degree graduate certificate program**

### **MGT 6063 INTERNATIONAL STUDIES CAPSTONE (3 HRS.)**

This course is designed to provide a capstone or conclusion to the International Studies Concentration. Its objective is to provide an opportunity to conduct independent research on an International Studies theme, analyzing a contemporary policy 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 6003, LDR 6023, LDR 6033, LDR 6043. Students must complete this course last in the MSL Program.**

### **MGT 6623 BUSINESS MANAGEMENT AND ENVIRONMENTAL LEADERSHIP (3 HRS.)**

In this course, students will gain expertise, enhance skills and broaden perspectives on environmental and natural resource management and leadership. As managerial effectiveness is central to environmental leadership, this course focuses on the development of management and leadership skills including decision-making, motivation, working in teams, organizational cultures, organizational design, and change management. Student will acquire cutting-edge environmental thinking providing them with the ability to make difficult environmental management decisions and effectively respond to environmental issues. **Prerequisites: All LDR Core (5000-level) courses OR admission to non-degree graduate certificate program**

### **MGT 6663 SUSTAINABLE AND ENVIRONMENTAL MANAGEMENT CAPSTONE (3 HRS.)**

The purpose of the integrative capstone course is to provide opportunities for students to apply the lessons learned in their previous courses to a real organization. Course instruction will center around a series of integrated modules that will focus on the practical implementation of all

aspects of the curriculum. Under the direction of faculty, this capstone course engages the student to work with a business chosen by the student and the development of a plan to significantly improve its sustainable business practices. Students will explore interconnections between the strategic foundation of their client project and the cultural, sustainable and core purpose and goals of their client's organization within a global business context. **Prerequisites: All LDR Core (5000-level) Courses and LDR 6603, LDR 6623, LDR 6633, LDR 6643. Students must complete this course last in the MSL Program**

## MARKETING

### **MK 203 MARKETING 3-0-3**

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.

**Prerequisite: Sophomore standing or permission of instructor**

### **MK 313 RETAIL MANAGEMENT 3-0-3**

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**

### **MK 323 INTEGRATED MARKETING COMMUNICATIONS 3-0-3**

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.

**Prerequisite: MK 203**

### **MK 343 INTERNATIONAL MARKETING 3-0-3**

This course provides a detailed examination into the principles and practices of international marketing as it applies to today's global economy. In-depth studies and analysis will be made of trade and commercial policies and practices, as well as international product adaptation, promotion, distribution, and pricing strategies. The student will examine the international marketing manager's role in the development of an export marketing program.

**Prerequisites: BA 343 and MK 203**

### **MK 363 BUYER BEHAVIOR 3-0-3**

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.

**(Same as PSY 3063) Prerequisite: MK 203**

**MK 423 PERSONAL SELLING 3-0-3**

This course examines the impact of personal selling in today's competitive marketplace. Topics examined are motivation, account selection, compensation, seller's role in the economy, and personality variables.

**Prerequisite: MK 203 and SP 203**

**MK 433 MARKETING MANAGEMENT 3-0-3**

This is the study of the planning, implementation, and outcomes of a firm's marketing program. Content will focus on identification, analysis, and reviews of internal/external factors associated with marketing policies and programs. **Prerequisite: MK 203**

**MK 463 MARKETING RESEARCH 3-0-3**

This is the study of techniques and approaches associated with researching marketing topics. It includes consumer research, market analysis, product research, advertising research, and sales analysis. **Prerequisites: MA 253 and MK 203**

**MK 473 E-MARKETING 3-0-3**

Electronic technologies are applied to the functions of marketing which are product, price, placement, and promotion. E-marketing transforms traditional business using new models that add customer value and increase profitability. The outcome of the course will be the creation of an E-marketing plan.

**Prerequisites: BA 113 and MK 203**

**MK 483 SENIOR SEMINAR IN MARKETING 3-0-3**

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: Senior Marketing Major or Minor in Marketing having completed most of the required marketing courses**

**MK 493 SPECIAL TOPICS IN MARKETING 3-0-3**

Offered to treat specific or current marketing issues in depth.

**Prerequisites: MK 203**

**MK 503 STRATEGIC MARKETING MANAGEMENT 3-0-3**

This course examines the collective marketing activities (pricing, promotion, placement, 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.

**Prerequisite: Graduate standing**

## MUSIC

### **MUS 100 RECITAL HOUR I 1-0-0**

A course for music majors to be taken concurrent with Applied Instruction to critically listen to performances by peers and guest artists.

### **MUS 101 SIGHT SINGING/EAR TRAINING I 1-0-1**

A study and application of sight singing techniques, dictation, chord recognition, error detection, and related activities.

**Corequisite: MUS 113**

### **MUS 112 PIANO LAB 0-1-1**

Designed to provide students with little or no piano background fundamentals of keyboard and musicianship on the piano.

### **MUS 113 MUSIC THEORY I 3-0-3**

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 AND LITERATURE I 3-0-3**

The study of composers, styles and literature and their influence on music in western culture from the Medieval period through the Baroque period.

### **MUS 201 SIGHT SINGING/EAR TRAINING II 3-0-1**

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**

### **MUS 213 MUSIC THEORY II 3-0-3**

The study of music theory and concepts including advanced four part writing, analysis, score study, and listening. **Prerequisite: MUS 113**

### **MUS 223 MUSIC HISTORY II 3-0-3**

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 3-0-3**

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 2-0-2**

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 AND CULTURE 3 CR**

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 3-0-3**

Music Literature I is a survey of masterworks, styles and forms of music from 1450 to 1900.

**MUS 1011 APPLIED STUDIES 0-1-1**

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 1110 PERCUSSION ENSEMBLE 0-1-0**

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 0-1-1**

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 0-1-0**

Brass Ensemble is open to all students and community members who play brasswind 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.**

**MUS 1121 BRASS ENSEMBLE 0-1-1**

Brass Ensemble is open to all students and community members who play brasswind 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.**

**MUS 1130 CHORAL CONCOURSE 0-1-0**

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

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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.**

### **MUS 1131 CHORAL CONCOURSE 0-1-1**

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.**

### **MUS 1140 CHAMBER ORCHESTRA 0-1-0**

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.**

### **MUS 1141 CHAMBER ORCHESTRA 0-1-1**

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.**

### **MUS 1150 MARCHING BAND 0-1-0**

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.**

### **MUS 1151 MARCHING BAND 0-1-1**

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.**

### **MUS 1160 WIND ENSEMBLE/PEP BAND 0-1-0**

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.**

### **MUS 1161 WIND ENSEMBLE/PEP BAND 0-1-1**

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.**

**MUS 1170 UNIVERSITY CHOIR 0-1-0**

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.**

**MUS 1171 UNIVERSITY CHOIR 0-1-1**

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.**

**MUS 1180 JAZZ BAND 0-1-0**

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 0-1-1**

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 0-3-0**

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**

**MUS 1191 JAZZ/SHOW CHOIR 0-3-1**

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**

**MUS 1200 MUSICAL THEATER/OPERA ENSEMBLE 0-3-0**

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 from the works.

**MUS 1201 MUSICAL THEATER/OPERA ENSEMBLE 0-3-1**

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 from the works.

## PHYSICS

### **PH 104 PHYSICAL SCIENCE 3-2-4**

A development of basic concepts and theories in the physical sciences and physics. Conceptual view of mechanics, thermodynamics, sound waves, electricity, magnetism, and optics.

### **PH 154 COLLEGE PHYSICS I 3-2-4**

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.

**Prerequisites: MA 113, MA 123**

### **PH 164 COLLEGE PHYSICS II 3-2-4**

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.

**Prerequisites: PH 154**

### **PH 224 UNIVERSITY PHYSICS I 3-2-4**

Underlying principles of measurement, vectors, translatory, rotary, uniform, circular, and harmonic motion, work, power, energy, and physical properties of liquids, solids, gases, and statics. Also the fundamentals of heat: thermometry, expansion of liquids, solids and gases, calorimetry, heat transfer, elementary thermodynamics, and fluids. Experimental investigation of selected topics. **Prerequisite: MA 134**

### **PH 224H HONORS UNIVERSITY PHYSICS I 3-2-4**

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.**

### **PH 234 UNIVERSITY PHYSICS II 3-2-4**

Study of vibrations and wave motion: different types of simple harmonic motion, sound. Also the fundamentals of electric fields, Gauss's Law, electric potential, capacitance, magnetism, direct, and alternating currents and circuits. Electromagnetic wave propagation and optics. Experimental investigation of selected topics.

**Prerequisites: MA 164, PH 224**

### **PH 234H HONORS UNIVERSITY PHYSICS II 3-2-4**

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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.

### **PH 303 INTRODUCTION TO MODERN PHYSICS 3-0-3**

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

### **PH 323 ELECTROMAGNETISM 3-0-3**

A study of electrostatics, special techniques for calculating potentials, electrostatic fields in matter, magnetostatic fields in matter, and Maxwell's equations.

**Prerequisites:** MA 233, PH 224, PH 234

### **PH 333 MECHANICS 3-0-3**

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

### **PH 343 MATHEMATICAL METHODS IN PHYSICS 3-0-3**

Emphasis on physics applications from the following topics: partial differential equations of mathematical physics. Orthogonal functions. Fourier series.

**Prerequisites:** MA 233, PH 234

### **PH 400X SPECIAL TOPICS IN PHYSICS VARIES (1-6 HRS.)**

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

## **PHILOSOPHY**

### **PHL 203 INTRODUCTION TO PHILOSOPHY 3-0-3**

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 251 ANCIENT GREECE FROM THE PERSIAN THROUGH PELOPONNESIAN WARS 1-0-1**

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)

**PHL 313 ETHICS 3-0-3**

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**

**PHL 323 PHILOSOPHY OF RELIGION 3-0-3**

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**

**PHL 333 ART, TECHNOLOGY AND SOCIETY 3-0-3**

An interdisciplinary effort to place modern technology within a social, cultural, and historical context. **Prerequisite: ENG 113 or ENG 133 (Same as SOC 333)**

**PHL 343 LOGIC 3-0-3**

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**

## **PLASTICS ENGINEERING TECHNOLOGY**

**PET 223 POLYMER STRUCTURES, PROPERTIES AND APPLICATIONS 3-0-3**

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.

**Prerequisite: ETD 123 or ES 233**

**PET 224 PLASTICS PROCESSING AND TESTING 1-4-3**

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. **Co-requisite: PET 223 or equivalent polymer science course.**

**PET 323 PLASTICS PRODUCT DESIGN 2-2-3**

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**

### **PET 333 PLASTICS MOLD ENGINEERING AND DESIGN 2-2-3**

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.

**Prerequisite: PET 223 or equivalent polymer science course; ETD 173 or EGR 143**

## **PRE-LEGAL STUDIES**

### **PL 4003 LEGAL CAPSTONE EXPERIENCE (3 HRS.)**

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**

## **PSYCHOLOGY**

### **PSY 113 PRINCIPLES OF PSYCHOLOGY 3-0-3**

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 OF PSYCHOLOGY 3-0-3**

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**

### **PSY 303 RESEARCH METHODS IN PSYCHOLOGY 3-0-3**

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**

### **PSY 313 TOPICS IN PSYCHOLOGY 3-0-3**

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**

**PSY 323 ABNORMAL PSYCHOLOGY 3-0-3**

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**

**PSY 333 PSYCHOLOGY OF PERSONALITY 3-0-3**

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**

**PSY 343 SOCIAL PSYCHOLOGY 3-0-3**

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**

**PSY 353 CHILD AND ADOLESCENT PSYCHOLOGY 3-0-3**

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**

**PSY 363 COUNSELING 3 CR**

Examines the theory and practice of counseling with a corporate or 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 333**

**PSY 373 POLITICAL PSYCHOLOGY 3-0-3**

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 GOV 373)**

**Prerequisites: GOV 113 or PSY 113**

**PSY 383 FORENSIC PSYCHOLOGY 3-0-3**

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**

**PSY 393 SPORT PSYCHOLOGY 3-0-3**

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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. **(Same as SM 393)**

**Prerequisite: PSY 113**

### **PSY 3063 BUYER BEHAVIOR 3-0-3**

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.

**(Same as MK 363)**

**Prerequisite: MK 203**

### **PSY 403 HUMAN SEXUALITY 3-0-3**

A survey of the historical, cultural, and psychological origins of sex differences as they relate to sex role identity, stereotyping, and related behavior. **Prerequisite: PSY 113**

### **PSY 413 THE PSYCHOLOGY OF ADDICTION 3-0-3**

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**

### **PSY 423 COUNSELING THEORIES AND PRACTICES 3-0-3**

A thorough review of contemporary approaches to counseling. This course examines the major current theories and practices in psychotherapy in detail.

**Prerequisite: PSY 323**

### **PSY 443 ADVANCED FORENSIC PSYCHOLOGY 3-0-3**

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, junior or senior standing and Department Chair approval**

### **PSY 453 CLINICAL INTERNSHIP I (3 HRS.)**

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**

### **PSY 463 CLINICAL INTERNSHIP II (3 HRS.)**

A continuation of PSY 453. May be taken concurrently with PSY 453.

**Prerequisite: Psychology major, senior standing and permission of the instructor**

**PSY 473 PSYCHOLOGY CAPSTONE DEMONSTRATION (3 HRS.)**

This capstone will provide students the opportunities to integrate and synthesize previous course work in psychology. **Prerequisite: All required coursework in Psychology core**

**PSY 400X INDEPENDENT STUDIES IN PSYCHOLOGY VARIES (1-4 HRS.)**

Credit earned through directed reading, independent study, research, or supervised field work. Maximum four hours credit. **Prerequisite: Permission of Department Chair**

## **REGULATORY AFFAIRS**

**RA 6103 INTRODUCTION TO BIOMEDICAL REGULATORY AFFAIRS (3 HRS.)**

This course surveys government oversight of devices and biotechnology derived products; laws and regulations that apply to development, testing and production. It also addresses the responsibilities of a regulatory affairs specialist the regulatory setting.

**Prerequisites: All LDR Core (5000-level) courses OR admission to non-degree graduate certificate program**

**RA 6123 PRODUCT DEVELOPMENT AND MANUFACTURING SYSTEMS (3 HRS.)**

This course covers product development and manufacturing concerns (such as quality control, scale-up, good manufacturing practices (GMPs) and quality systems), the U.S. Food and Drug Administration inspection process, and FDA regulatory actions. Focus on the QSIT (Quality System Inspection Technique).

**Prerequisites: All LDR Core (5000-level) courses OR admission to non-degree graduate certificate program**

**RA 6143 PRODUCT TESTING, EVALUATION, CLINICAL TRIALS, AND POST-MARKET ISSUES (3 HRS.)**

This course focuses on post-marketing requirements, reporting and enforcement actions. Emphasis is on inspection (internal and by regulators) preparation, conduct and follow-up actions. It also introduces the major concepts under which clinical trials are designed and run, including the phases of clinical trials, study design and statistical concepts, the role of the U.S. Food and Drug Administration, Institutional Review Boards, the Code of Federal Regulations and ethical principles. Post-marketing surveillance and studies, and reimbursement and economics of biomedical interventions are discussed.

**Prerequisites: All LDR Core (5000-level) courses OR admission to non-degree graduate certificate program**

**RA 6163 BIOMEDICAL REGULATORY AFFAIRS CAPSTONE (3 HRS.)**

This course provides a practical experience to ensure that participants can conceptualize the shepherding of new biomedical products through regulatory, clinical and quality assurance aspects. Students work on projects of their choice under the guidance of an adviser. The final report will consist of a comprehensive regulatory strategy work plan for a product, using knowledge gained in the concentration-area courses.

**Prerequisites: All LDR Core (5000-level) Courses and LDR 6103, LDR 6123, LDR 6133, LDR 6143. Students must complete this course last in the MSL Program.**

## SCIENCE

### **SCI 400X INDEPENDENT STUDIES IN SCIENCE VARIES (1-4 HRS.)**

Credit earned through directed reading, independent study, research, or supervise field work.

**Prerequisite: Permission of the Department Chair**

### **SCI 412 SENIOR RESEARCH SEMINAR 1-3-2**

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.

**Prerequisite: Permission of the Department Chair**

### **SCI 422 SENIOR RESEARCH PROJECT 0-6-2**

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.

**Prerequisite: SC I 412, Senior standing**

### **SCI 43X SCIENCE INTERNSHIP VARIES (2-4 HRS.)**

An extended professional work experience in an area related to the student's major. The work experience consists of at least 80 hours of documented work hours (which is equal to 2 hours of credit). **Prerequisite: Permission of Department Chair**

## SPORT MANAGEMENT

### **SM 133 CONTEMPORARY ISSUES IN SPORT 3-0-3**

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 sport.

### **SM 223 HISTORY OF PHYSICAL EDUCATION AND SPORT 3-0-3**

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 253 RISK MANAGEMENT 3-0-3**

Consideration of the legal aspects involved with physical education and sport activities. Emphasis on negligence case law, liability issues and facility safety.

### **SM 313 PRINCIPLES OF SPORT AND RECREATION MANAGEMENT 3-0-3**

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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.

**Prerequisite: Junior standing or permission of instructor**

### **SM 323 LEADERSHIP IN SPORT AND RECREATION 3-0-3**

Investigation of leadership theories and practical applications for managers in sport and recreation settings. Exploration of the interrelationship between leadership and group dynamics.

**Prerequisite: Junior standing or permission of instructor**

### **SM 393 SPORT PSYCHOLOGY 3-0-3**

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. **Prerequisite: PSY 113 (same as PSY 393)**

### **SM 403 INTERNSHIP IN SPORT MANAGEMENT (3 HRS.)**

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: Junior standing or permission of instructor**

### **SM 404 CAPSTONE EXPERIENCE IN SPORT MANAGEMENT 4-2-4**

The culminating final project of a Sport Management major. With the guidance of a professor the student will research a topic related to sport and the industry of sports and write a significant paper with cited references and statistics that examines the issue in great detail. Topics must be approved by the mentoring professor and the student must present his/her research in an open forum to selected faculty members for their examination. **Prerequisite: Junior standing or permission of instructor**

### **SM 412 BUSINESS PLANNING IN SPORT AND RECREATION 2-0-2**

The creation of a business plan for a sport/recreation operation. **Prerequisite: LAW 203**

### **SM 413 ORGANIZATION & ADMINISTRATION OF PHYSICAL EDUCATION AND ATHLETICS 3-0-3**

Theories establishing the procedures for facility, curriculum and faculty development in physical education and athletics are examined.

**Prerequisite: Junior standing or permission of instructor**

### **SM 416 INTERNSHIP IN SPORT MANAGEMENT (6 HRS.)**

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: Junior standing or permission of instructor**

### **SM 453 FACILITY PLANNING 3-0-3**

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

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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.

**Prerequisite: Junior standing or permission of instructor**

### **SM 6703 FOUNDATIONS OF ATHLETIC ADMINISTRATION (3 HRS.)**

This course will present a philosophy of the leadership and organization of interscholastic athletic programs, principles, strategies and methods of sports management and athletic administration, frameworks to identify and unify the athletic community through character-based standards, and best practices in fundraising, marketing and promotion of athletic programs and events. Incorporates NIAAA Short Courses: LTC 501, 502, 611, 720 **Prerequisites: All LDR Core (5000-level) courses OR admission to non-degree graduate certificate program**

### **SM 6713 THE MARKETING IN INTERCOLLEGIATE AND PROFESSIONAL ATHLETICS (3 HRS.)**

In this is course, students will learn how the dynamics of marketing and consumer behavior apply to sports organizations which is essential for those who desire to become professionals within interscholastic athletics. Beginning with an overview of basic marketing theories and concepts. Students will gain insight into the ethics of sport marketing, fundraising, and developing a marketing plan for an athletic program

**Prerequisites: All LDR Core (5000-level) courses OR admission to non-degree graduate certificate program**

### **SM 6723 LEGAL AND ETHICAL ISSUES IN ATHLETIC ADMINISTRATION (3 HRS.)**

This course will guide students in utilizing institutional and established legal guidelines to consider all aspects of liability related to athletic performance, and creating and maintaining a strategic plan for managing risk and maintaining safety, equity, and integrity in the context of interscholastic athletic programs. Incorporates NIAAA Short Courses: LTC 504, 506, 508, 617

**Prerequisites: All LDR Core (5000-level) courses OR admission to non-degree graduate certificate program**

### **SM 6733 ATHLETIC COACHING (3 HRS.)**

In this is course, students focus on the components of successful coaching. Topics include: personal objectives, coaching styles, roles of head coach, training rules, and practice, current coaching methods, drug/alcohol and domestic violence policies for student athletes, stress and burnout, and coaching philosophy.

**Prerequisites: All LDR Core (5000-level) courses OR admission to non-degree graduate certificate program**

### **SM 6743 ATHLETIC FACILITY AND EVENT MANAGEMENT (3 HRS.)**

This course presents opportunities for students to analyze best practices and challenges to securing, maintaining, and managing safe, resilient, and attractive indoor and outdoor athletic facilities and equipment that is readily available to students for athletic preparation and interscholastic competitive events.

Incorporates NIAAA Short Courses: LTC 615, 616, 618, 630

**Prerequisites: All LDR Core (5000-level) courses OR admission to non-degree graduate certificate program**

### **SM 6753 ADMINISTRATION OF ATHLETICS (3 HRS.)**

This course is designed to provide students with a knowledge and understanding of the power and politics of sport organizations that govern intercollegiate athletics. Students will analyze how people involved in governance set the tone of an organization and how individual sport bodies fit into the greater industry. Emphasis will be placed upon the student's development of a working knowledge of what organizations do and what their purpose is in the administration of an intercollegiate department. Specific tasks in the administration of an effective athletic department will be presented.

**Prerequisites: All LDR Core (5000-level) courses OR admission to non-degree graduate certificate program**

### **SM 6763 SPORT MANAGEMENT CAPSTONE COURSE (3 HRS.)**

This course is the capstone course for all students in the Sports Management Concentration. The capstone is a special project conducted within an existing athletic 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 interscholastic athletic need or issue.

Incorporates NIAAA Short Courses: LTC 710A – Current Issues in American Sports

**Prerequisites: All LDR Core (5000-level) Courses and LDR 6703, LDR 6723, LDR 6733, LDR 6743. Students must complete this course last in the MSL Program.**

## **SOCIOLOGY**

### **SOC 103 PRINCIPLES OF SOCIOLOGY 3-0-3**

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 243 ECONOMICS OF SOCIAL ISSUES 3 CR**

An economic analysis of social issues, such as the problems of pollution, poverty, crime, and the use of drugs. A study of the economic consequences of various social and economic policies, population pressures and related energy and pollution problems. **Prerequisite: ECO 213 (same as ECO 243)**

### **SOC 313 TOPICS IN SOCIOLOGY 3-0-3**

Selected topics in sociological content such as criminology, minority groups, urbanization, and the like. Topics will vary from semester to semester. **Prerequisite: SOC 103**

### **SOC 323 THE FAMILY 3-0-3**

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**

**SOC 333 ART, SOCIETY AND TECHNOLOGY 3-0-3**

An interdisciplinary effort to place modern technology within a social, cultural and historical context.

**Prerequisite: ENG113 or ENG 133 (same as PHL 333)**

**SOC 343 SOCIAL PSYCHOLOGY 3-0-3**

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.

**Prerequisite: PSY 113 (Same as PSY 343)**

**SOC 363 COUCELING 3 CR**

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. **Prerequisite: PSY 333 (same as PSY 363)**

**SPEECH**

**SP 103 INTRODUCTION TO THEATER 3-0-3**

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.

**SP 203 EFFECTIVE SPEAKING 3-0-3**

Application of communication principles to improve extemporaneous public speaking and listening skills. Considers principles of audience analysis and rhetorical invention, worthy and effective evidence and inductive reasoning, speaker and source credibility, organization and outlining, effective speaker-audience interaction, listening for comprehension, and critical listening. **Prerequisite: ENG 113 or ENG 133**

**SPANISH**

**SPN 103 SPANISH CONVERSATION I 3-0-3**

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.

**SPN 113 SPANISH READING AND WRITING I 3-0-3**

An introduction to the Spanish language with an emphasis on reading and writing in Spanish. Vocabulary development and the basics of Spanish structure are also covered. No previous study of Spanish is required.

**SPN 123 SPANISH II 3-0-3**

A continuation of Spanish 113, integrating listening, speaking, reading, and writing skills. Basic grammar and Latin American and Spanish cultures are covered.

**Prerequisite: SPN 113 or by placement**

**SPN 203 SPANISH III 3-0-3**

An intermediate Spanish class with an emphasis on reading and writing skills and grammar review. Students explore Hispanic culture through readings based on historical as well as current events. Conversational skills are also emphasized. **Prerequisite: SPN 123 or by placement**

**SPN 213 SPANISH IV 3-0-3**

A continuation of Spanish III, with an emphasis on increasing reading speed and comprehension as well as improving writing fluency and accuracy. The difficulty level of the reading selections increases in this course. **Prerequisite: SPN 203**

## **UNIVERSITY EXPERIENCE**

**UE 012 ACADEMIC FOUNDATIONS 2-1-0**

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 111 ADULT LEARNING ORIENTATION 1 CR**

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 understanding the expectations of an adult 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 101 UNIVERSITY EXPERIENCE 1-0-1**

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 201 Success Skills and Reflection 1-0-1**

This course provides an opportunity to build and reflect on college success skills. It is required for students on academic probation.

**UE 301 PEER MENTORING 1-0-1**

This course trains a student to provide mentoring for second-year students at Trine University. **Prerequisite: Junior standing or permission of instructor**

## **WOMEN'S STUDIES**

**WS 103 INTRODUCTION TO WOMEN'S STUDIES 1-0-3**

Introduction to Women's Studies offers an interdisciplinary exploration of the psychosociological 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,

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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 103 or ENG 104; Prerequisite or Corequisite: ENG 113 or ENG 133**

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**CALENDAR – Main Campus & School of Professional Studies (SPS)**

**FALL 2014**

**MAIN CAMPUS FALL SEMESTER 2014**

August 26	Classes begin
September 1	Labor Day (no classes)
September 2	Last day to add a course & drop a course at 100% refund
September 2	Term 1 begins – Online (OL) courses
October 13-14	Fall Break (no classes)
October 25	Term 1 ends – (OL)
October 27	Term 2 begins – (OL)
November 26-28	Thanksgiving break (no classes)
December 12	Last class day
December 15-18	Final exams
December 20	Term 2 Ends – (OL)

**SPS FALL SEMESTER 2014 [Face-to-Face (F2F) and Online (OL)]**

September 1	Labor Day (no classes)
September 2	Term 1 begins – Face2Face (F2F) & Online (OL) courses
September 8	Last day to add a course & drop a course at 100% refund
October 25	Term 1 Ends
October 27	Term 2 Begins
November 3	Last day to add a course & drop a course at 100% refund
November 26 - 28	Thanksgiving Break (no classes)
December 20	Term 2 Ends

**PLEASE SEE NEXT PAGE SPRING 2015**

## SPRING 2015

### **MAIN CAMPUS SPRING SEMESTER 2015**

January 13	Classes begin (Main Campus & OL)
January 19	Martin Luther King Jr. Day (no classes)
January 20	Last day to add a course & drop a course at 100% refund
March 2-6	Spring Break (no classes)
March 7	Term 1 ends – (OL)
March 9	Term 2 begins – (OL)
April 3	Good Friday (no classes)
May 1	Last Class Day
May 2	Term 2 ends – (OL)
May 4-7	Finals
May 9	Commencement

### **SPS SPRING SEMESTER 2015 [Face-to-Face (F2F) and Online (OL)]**

January 12	Term 1 begins – Face2Face (F2F) courses
January 13	Term 1 begins – Online (OL) courses
January 20	Last day to add a course & drop a course at 100% refund – (F2F)
January 20	Last day to add a course & drop a course at 100% refund – (OL)
January 19	Martin Luther King Jr. Day (no classes)
March 7	Term 1 ends – (F2F & OL)
March 9	Term 2 Begins (F2F & OL)
March 16	Last day to add a course & drop a course at 100% refund – (F2F & OL)
April 3	Good Friday (no classes)
May 2	Term 2 Ends – (F2F & OL)
May 9	Commencement

**PLEASE SEE NEXT PAGE FOR SUMMER 2015**

## SUMMER 2015

\* All Graduate classes, regardless of format, follow the 8-week Face to Face summer schedule

### MAIN CAMPUS SUMMER SEMESTER 2015

May 18	Classes begin – (Maymester, 12-Week, First 6-Weeks, and Term 1 OL)
May 25	Memorial Day (No Classes)
June 5	Last Class Day – (Maymester)
June 6	Finals – (Maymester)
June 25	Last Class Day – (First 6-Weeks)
June 26	Finals – (First 6-Weeks) No 12-Week Classes
June 27	Term 1 ends – (OL)
June 29	Classes begin – (Second 6-Weeks and Term 2 OL)
July 3	July 4 <sup>th</sup> Holiday Observed (no classes)
August 6	Last Class Day (12-Week and Second 6-Weeks)
August 7-8	Finals (12-Week and Second 6-Weeks)
August 8	Term 2 ends – (OL)

### SPS SUMMER SEMESTER 2015 [Face-to-Face (F2F) and Online (OL)]

May 4	Term 1 begins – Face2Face (F2F) courses
May 18	Term 1 begins – Online (OL) courses
May 11	Last day to add a course & drop a course at 100% refund – (F2F)
May 25	Memorial Day (no classes)
May 26	Last day to add a course & drop a course at 100% refund – (OL)
June 27	Term 1 ends – (F2F & OL)
June 29	Term 2 Begins (F2F & OL)
July 3	July 4 <sup>th</sup> Holiday Observed (no classes)
July 6	Last day to add a course & drop a course at 100% refund – (F2F & OL)
August 8	Term 2 Ends – (OL)
August 22	Term 2 Ends – (F2F)

\* All Graduate classes, regardless of format, follow the 8-week Face to Face summer schedule