

Dear Trine Student,

Welcome to the Trine University family! It is our mission to promote your intellectual and personal development through professionally focused and formative learning opportunities, preparing you to succeed, lead and serve. We have taught generations of successful learners and plan to do so for years to come. With an educational heritage spanning 130 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. More than 1,900 respected businesses, companies, and organizations around the world seek out our graduates because of the quality of a Trine education. Our job-placement numbers speak for themselves. We have consistently placed over 98 percent of our graduates in graduate school or found meaningful employment within six months of graduation. Our graduates also go on to pursue doctorates at schools such as Yale, Stanford, University of Michigan and Case Western, to name a few.

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

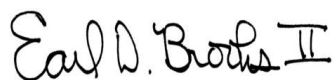
Your professors will expect active participation, collaboration, theoretical study and creativity. Not only will you learn how to do, you'll also learn what to do. We are giving you the tools – quality teaching, labs, resources, technology, support – to be successful in your college career. It's up to 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 help prepare you to succeed, lead and serve.

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

Pride in Who We Are. It's A Trine Thing.

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 from associate to the doctoral level through six schools—Allen School of Engineering and Computing, Franks School of Education, Jannen School of Arts & Sciences, Ketner School of Business, Rinker-Ross School of Health Sciences, and the College of Graduate and 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.

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

### **ACCREDITATION**

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

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

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

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

The **Doctor of Physical Therapy** Program at Trine University is accredited by the Commission on Accreditation in Physical Therapy Education (CAPTE), 1111 North Fairfax Street, Alexandria, Virginia 22314; telephone: 703-706-3245; email: [accreditation@apta.org](mailto:accreditation@apta.org); website: [www.capteonline.org](http://www.capteonline.org).

The ARC-PA has granted Accreditation-Provisional status to the Trine University **Physician Assistant Program** sponsored by Trine University. Accreditation-Provisional is an accreditation status granted when the plans and resource allocation, if fully implemented as planned, of a proposed program that has not yet enrolled students appear to demonstrate the program's ability to meet the ARC-PA Standards or when a program holding Accreditation-Provisional status appears to demonstrate continued progress in complying with the Standards as it prepares for the graduation of the first class (cohort) of students. Accreditation-Provisional does not ensure any subsequent accreditation status. It is limited to no more than five years from matriculation of the first class.

### **TITLE IX NOTICE OF NON-DISCRIMINATION**

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

Jamie Norton  
Director of Human Resources  
Trine University  
One University Avenue  
Angola, Indiana 46703  
260.665.4848 (Direct)  
[nortonj@trine.edu](mailto:nortonj@trine.edu)

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

Francisco Ortiz  
Dean of Students  
Trine University  
One University Avenue  
Angola, Indiana 46703  
260-665-4171 (Direct)  
[ortizf@trine.edu](mailto:ortizf@trine.edu)

Jacqueline Delagrangé  
Chair, Department of Criminal Justice  
Trine University  
One University Avenue  
Angola, Indiana 46703  
260-203-4187 (Direct)  
[delagrangej@trine.edu](mailto:delagrangej@trine.edu)

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

Michelle Blank  
Trine University  
One University Avenue  
Angola, Indiana 46703  
260.665.4179  
[blankm@trine.edu](mailto:blankm@trine.edu)

**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*.

**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, Camps Safety, Student Health 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 and Computing, Franks School of Education, Jannen School of Arts & Sciences, Ketner School of Business, Rinker-Ross School of Health Sciences, and College of Graduate and Professional Studies, with graduate degree programs in criminal justice, leadership, business, and engineering, and a doctorate in physical

therapy. In Fall 2019, Allen School of Engineering and Technology became Allen School of Engineering and Computing.

### **CORPORATE STATUS**

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

### **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. Although 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 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 and Computing.

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 Informatics; the Department of Mathematics & Physics; 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 and Computing**, 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.

### **COLLEGE OF GRADUATE AND PROFESSIONAL STUDIES (CGPS)**

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

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

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

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

**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**

421 East Broadway  
Logansport, IN 46947  
[logansport@trine.edu](mailto:logansport@trine.edu)

**South Bend Regional Campus**

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

**Centreville Educational Center**

62249 Shimmel Rd  
Centerville, MI  
[centreville@trine.edu](mailto:centreville@trine.edu)

**Warsaw Education Center**

907 Wooster Road  
Winona Lake, Indiana 46590

**Additional Locations**

Carew Educational Center  
1819 Carew St.  
Ft. Wayne, IN 260-203-2914  
[DPT@trine.edu](mailto:DPT@trine.edu)

## **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 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.

### **STEM FOCUSED PROGRAM APPLICANTS**

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

### **MATH AND ENGLISH PLACEMENT**

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

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

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

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

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

### **CGPS STUDENTS**

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

### **NON-DEGREE STUDENTS**

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

### **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 coursework offered by the military as recommended by the American Council on Education in its Guide to the Evaluation of Educational Experiences in the Armed Services. Credits 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's 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 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

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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 coursework 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 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).



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- 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 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 for the PLP is listed below.

1. 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 evaluations will be copies of the originals kept by the employer and must show signatures to be considered as proof of performance.
2. Autobiography
  - 1 – 2 page document that allows the student to share their personal story.
3. 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 for every position submitted for evaluation.
4. Additional acceptable evidence
  - Letters from current and past employers verifying job responsibilities and/or information
  - Copies of newspaper articles, special awards received and letters and recommendation
  - Samples of writing and/or computer skills including letters, brochures, and programs
  - Photocopies of licenses and certificates of complete for non-credit work

## AWARDING OF CREDIT BY EXAMINATION

### ADVANCED PLACEMENT (AP) EXAMINATION

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

AP COURSE/EXAM	SCORE	EQUIVALENT COURSE	CREDIT HOURS
<b>Arts</b>			
Art History	3, 4, 5	Humanities Elective	3
Music Theory	3, 4, 5	MUS103 Intro to Music Theory	3
Studio Art 2-D Design	3, 4, 5	Humanities Elective	3
Studio Art 3-D Design	3, 4, 5	Humanities Elective	3
Studio Art Drawing	3, 4, 5	Humanities Elective	3
<b>English</b>			
English Language & Composition	3, 4, 5	ENG103 & 113 English Comp I & II	6
English Literature & Composition	3, 4, 5	ENG103 & 153 English Comp I/Intro to Lit	6
<b>History &amp; Social Sciences</b>			
Comparative Govern. & Politics	3, 4, 5	POLS113 Intro to Government	3
European History	3, 4, 5	HIS203 & 213 World Civilization I & II	6
Human Geography	3, 4, 5	GEO303 Human Geography	3
Macroeconomics	3, 4, 5	ECO223 Macroeconomics	3
Microeconomics	3, 4, 5	ECO213 Microeconomics	3
Psychology	3, 4, 5	PSY113 Principles of Psychology	3
U.S. Government & Politics	3, 4, 5	POLS113 Intro to Government	3
United States History	3, 4, 5	HIS103 & 113 American History I & II	6
World History	3, 4, 5	HIS203 & 213 World Civilization I & II	6
World History: Ancient	3, 4, 5	HIS203 World Civilization I	3
World History: Modern	3, 4, 5	HIS213 World Civilization II	3
<b>Math &amp; Computer Science</b>			
Calculus AB	3	MA173 Essential Calculus	3
Calculus AB	4, 5	MA134 Calculus I	4
Calculus BC	4, 5	MA134 & 164 Calculus I & II	8
Calculus BC subscore	4, 5	MA134 Calculus I	4
Computer Science Principles	3, 4, 5	CSIT103 Intro to Information Systems	3
Computer Science A	3, 4, 5	INF143 Introduction to C#	3
Statistics	3, 4, 5	MA253 Statistics	3
<b>Sciences</b>			
Biology	3, 4, 5	BIO114 Principles of Biology	4
Chemistry	3, 4	CH104 General Chemistry I	4
Chemistry	5	CH155 Advanced Gen Chemistry	5
Environmental Science	3, 4, 5	BIO214 Conservation	4
Physics I	3, 4, 5	PH154 College Physics I	4
Physics 2	3, 4, 5	PH164 College Physics II	4
Physics C: Electricity & Magnetism	3, 4, 5	PH234 University Physics II	4
Physics C: Mechanics	3, 4, 5	PH224 University Physics I	4
<b>World Languages &amp; Culture</b>			
Chinese Language & Culture	3, 4, 5	Humanities Elective	6
French Language & Culture	3, 4, 5	FRN113 & 123 French I & II	6
German Language & Culture	3, 4, 5	GER104 & 114 German I & II	8
Italian Language & Culture	3, 4, 5	Humanities Elective	6
Japanese Language & Culture	3, 4, 5	Humanities Elective	6
Latin	3, 4, 5	Humanities Elective	3
Spanish Language & Culture	3, 4, 5	SPN 113 & 123 Spanish I & II	6

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Spanish Literature & Culture	3, 4, 5	SPN 113 Spanish I & Humanities Elective	6
<i>Transfer credit subject to Department approval</i>			

### 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.

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.

CLEP EXAM	SCORE	EQUIVALENT COURSE	CREDIT HOURS
<b>Business</b>			
Financial Accounting	50	AC 203 Accounting I	3
Information Systems	50	BA 113 Business Computer Applications	3
Intro Business Law	50	LAW 203 Business Law I	3
Principles of Management	50	Electives	3
Principles of Marketing	50	MK 203 Marketing	3
<b>Composition &amp; Literature</b>			
American Literature	50	ENG 2113 American Literature I	3
Analyzing & Interpreting Literature	50	ENG 153 Intro to Literature	3
College Composition	50	ENG 103 English Comp I & Electives	6
College Composition Modular	50	ENG 103 English Comp I	3
English Literature	50	ENG 2013 British Literature	3
Humanities	50	Humanities Electives	3
<b>World Languages</b>			
French Language, Level 1	50	FRN 113 French I	3
French Language, Level 2	59	FRN 113 French I & FRN 123 French II	6
German Language, Level 1	50	GER 104 German I	4
German Language, Level 2	60	GER 104 German I & GER 114 German I	8
Spanish Language, Level 1	50	SPN 113 Spanish Reading & Writing	3
Spanish Language, Level 2	63	SPN 113 Spanish & SPN 123 Spanish II	6
<b>History &amp; Social Sciences</b>			
American Government	50	POLS 113 Intro to Government	3
History of the United States I	50	HIS 103 American History I	3
History of the United States II	50	HIS 113 American History II	3
Human Growth & Development	50	Psychology Elective	3
Intro to Educational Psychology	50	Psychology Elective	3
Introductory Psychology	50	PSY 113 Principles of Psychology	3
Introductory Sociology	50	SOC 103 Principles of Sociology	3
Principles of Macroeconomics	50	ECO 223 Macroeconomics	3
Principles of Microeconomics	50	ECO 213 Microeconomics	3
Social Sciences & History	50	Social Science Elective	6
Western Civilization I	50	HIS 203 World Civilization I	3
Western Civilization II	50	HIS 213 World Civilization II	3
<b>Science &amp; Mathematics</b>			
Biology	50	BIO 114 Principles of Biology	4
Calculus	50	MA 134 Calculus I	4
Chemistry	50	CH 104 General Chemistry I	4
College Algebra	50	MA 113 College Algebra	3
College Mathematics	50	Math Elective	3
Natural Sciences	50	Science Elective	3

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Precalculus	50	MA 124 Precalculus	4
<i>Transfer credit subject to Department approval</i>			

### 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 other Trine University merit-based awards, but not to exceed tuition.
- Renewal Criteria: must continue to pursue a Trine University engineering or technology degree and make satisfactory progress towards completing the degree.
- Eligibility: must have completed a minimum of two PLTW high school courses with grade of “B” or better in each course and provide a transcript documenting these courses from a PLTW certified high school.

Program	Maximum Possible Trine Transfer Credits <sup>1</sup>	Remarks <sup>2</sup>
<b>Engineering</b>		
Civil Engineering	3	Need to take IED, POE <b>and</b> CEA to earn 3 credits as Professional Development Elective.
Computer Engineering	3	Need to take IED, POE, EDD and DE (or CIM) to earn 3 unrestricted elective credits.
Electrical Engineering	3	Need to take IED, POE, EDD and DE (or CIM) to earn 3 unrestricted elective credits.
Software Engineering	3	Need to take IED, POE, EDD and DE (or CIM) to earn 3 unrestricted elective credits.
Biomedical Engineering	4	Need to take any 2 of the PLTW courses from the list below.
Mechanical Engineering	6	IED, POE (and/or AE) will count as a maximum of 6 unrestricted elective credits.
Chemical Engineering	7	Need to take any 3 of the PLTW courses from the list below.
Design Engineering Technology	15	IED will transfer as ETD 103 POE will transfer as ETD 203 DE will transfer as ETD 273 Up to 6 additional credits may be granted as unrestricted elective credits.
<b>Biomedical Sciences</b>		
Biology	8	2 credit hours of general electives per PLTW course below
Chemistry	8	2 credit hours of general electives per PLTW course below
Biochemistry	8	2 credit hours of general electives per PLTW course below
Forensic Science	8	2 credit hours of general electives per PLTW course below
Exercise Science	8	2 credit hours of general electives per PLTW course below
<i>Transfer credit subject to Department approval</i>		

### Notes

<sup>1</sup> These are the maximum unrestricted electives in each major.

<sup>2</sup> Students must earn a “B” or better to earn credit.

#### **PLTW Engineering Courses**

IED = Intro to Engineering Design  
 POE = Principles of Engineering  
 AE = Aerospace Engineering  
 CEA = Civil Engineering and Architecture  
 CIM = Computer Integrated Manufacturing

#### **PLTW Biomedical Science Courses**

PBS = Principles of Biomedical Science  
 HBS = Human Body Systems  
 MI = Medical Interventions  
 BI = Biomedical Innovation

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CSP = Computer Science Principles  
DE = Digital Electronics  
ES = Environmental Sustainability  
EDD = Engineering Design and Development

### **UNIVERSITY CREDIT BY EXAM**

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

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

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

To qualify for Dual Enrollment, students must meet the following requirements: submit an official Dual Enrollment application and a current high school transcript, be in good academic standing in high school (GPA of B or higher or by recommendation of the high school guidance counselor), 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](http://www.trine.edu) 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 from regionally accredited institutions of higher learning, and those approved by the transfer coordinator. Students cannot be on academic probation from the previous institution(s).

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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 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 Allen School of Engineering and Computing and the Rinker Ross School of Health Sciences must have a minimum cumulative grade point average of 2.5 and a grade of "C" or better in Calculus I, Chemistry I, and English Composition I.

Transfer students applying to the Franks School of Education must have a minimum cumulative grade point average of 3.0 and a grade of "C" or better in English Composition I.

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

- Ancilla College, Plymouth, IN
- Bethel College, Mishawaka, IN
- Delta College, University Center, MI
- Glen Oaks Community College, Centreville, MI
- Grand Rapids Community College, Grand Rapids, MI
- Ivy Tech Community College, IN
- Jackson Community College, Jackson, MI
- Joliet Junior College, Joliet, IL
- Kalamazoo Valley Community College, Kalamazoo, MI
- Kellogg Community College, Battle Creek and Coldwater, MI
- Lake Michigan College, Benton Harbor, MI
- Lansing Community College, Lansing, MI
- Mid-Michigan College, Harrison, MI
- Northwest Michigan College, Traverse City, MI
- Northwest State Community College, Archbold, OH
- Owens Community College, Toledo, OH
- Southwestern Michigan College, Dowagiac, MI
- Vincennes University, Terre Haute, IN
- West Shore Community College, Scottville, MI

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.

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### **COLLEGE OF GRADUATE AND 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 with the following two- and four-year institutions:

- Bethel College, Mishawaka, IN
- 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
- 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. In determining transfer credit for the main campus, the Director of Transfer Admission evaluates all transfer credit. The Director then sends the accepted credit to the Department Chair who approves and returns it to the Director who forwards to the Registrar. The Registrar approves the credit and adds it to the records. In determining transfer credits for CGPS, the CGPS Transfer Coordinator evaluates all transfer credit for the distance locations. The credit is then sent to the Dean of CGPS for approval, the Dean then returns to the Director who forwards to the Registrar. An evaluation of transfer credit shall be made when the University receives an official transcript of the completed coursework. To facilitate the evaluation, the applicant should provide the Office of Admission with a catalog or guide which contains descriptions of the courses completed elsewhere.

### **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**

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

### **FINANCIAL GUARANTEE**

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

### **ACADEMIC RECORDS**

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

### **TEST SCORES**

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



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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.

### **COLLEGE OF GRADUATE AND PROFESSIONAL STUDIES**

A student whose enrollment is interrupted for any reason for more than one semester, not including summer, is considered to have withdrawn and must be readmitted. Candidates for readmission must complete a readmission application through the admission counselor of the educational center where the student intends to enroll.

Any student dismissed for academic or other disciplinary reasons must make application through the admission counselor 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**

For updated payment of costs please go to [trine.edu/costs](http://trine.edu/costs).

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

### **FLAT RATE TUITION**

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

### **AUDITING FEE**

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

### **COURSE FEES**

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

### **ENGINEERING AND SCIENCE FEE**

A fee is charged for all engineering and science majors.

### **ENROLLMENT DEPOSIT**

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

### **DISCOUNTED TUITION**

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

An eligible student must meet the qualifying criteria:

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

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

### **INTERNATIONAL FEE**

All entering international students are assessed a one-time non-refundable fee 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.

### **OTHER COSTS**

#### **BOOKS AND SUPPLIES**

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

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

#### **COLLEGE OF GRADUATE AND PROFESSIONAL STUDIES LAPTOP COMPUTER / TABLET REQUIREMENT**

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

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

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

#### **MISCELLANEOUS FEES**

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

#### **MAIN CAMPUS ROOM AND BOARD**

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

## **PERSONAL EXPENSES**

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

## **PERSONAL INSURANCE**

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

## **REFUNDS**

### **MAIN CAMPUS**

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

#### Tuition Fall and Spring Semester

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

#### Tuition Summer Semester

- Week One—100%
- Week Two—0%

#### Room and Board

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

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

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

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

### **COLLEGE OF GRADUATE AND PROFESSIONAL STUDIES**

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

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

### Tuition Adjustment

- Week One—100%
- Week Two—0%

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

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

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

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

### **WITHDRAWAL**

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

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

### **TEACH OUT PLAN** (Closing an Education Center)

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

### **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 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 student with economic need.

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

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

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

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

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

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

### **APPLICATION PROCEDURES**

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

The FAFSA for new applicants or returning applicants is the primary application for assistance. This can be filed on line at [www.fafsa.gov](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 Trine University priority application filing deadline is March 1 of each academic year for fall/spring/summer enrollment; however, aid is awarded throughout the school year. Current students need only complete the FAFSA once each academic year before March 1 to reapply

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for all aid. The Trine University FAFSA filing priority deadline is March 1 to be eligible for all types of institutional aid.

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

### **SATISFACTORY ACADEMIC PROGRESS GENERAL INFORMATION**

Trine is required to establish satisfactory academic progress standards (SAP) for its federal, institutional and state financial aid recipients in accordance with the US Department of Education regulations. These standards will ensure that only those recipients who demonstrate satisfactory progress towards the completion of their educational programs (degrees) can continue to receive financial aid from all sources.

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

### **LOAN ELIGIBILITY**

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

### **AWARDING PROCESS**

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

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

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

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

## **MAIN CAMPUS UNDERGRADUATE SCHOLARSHIPS**

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

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

## **MERIT-BASED SCHOLARSHIPS**

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

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

## **ACADEMIC SCHOLARSHIPS**

Scholarship grants to full-time, main campus degree seeking students are based on test scores, either SAT or ACT, and cumulative grade point averages (GPA). The ranges of awards are from \$500 up to full tuition for the academic year. Awards are renewable each year that a recipient is enrolled at Trine University as a full-time student (up to four years) and maintains a satisfactory GPA. Additional details can be found on the Financial Aid website. Awards are available to incoming freshmen and transfer students, both commuters and residents.

## **LEGACY AWARDS**

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

## **NEED-BASED ASSISTANCE**

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

## **FEDERAL GRANTS**

Federal Pell Grants - \$605 to \$5645

Federal Supplemental Educational Opportunity Grants (FSEOG) - \$200 to \$4000

(Amounts vary depending upon federal funding.)

Note: The amount of *Federal Pell Grant* funds you may receive over your lifetime is limited by a new federal law to be the equivalent of six years of Pell Grant funding. Since the maximum



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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> 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.

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

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

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

### **PARENT LOANS**

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

### **ENROLLMENT STATUS**

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

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

### **MAINTAINING ELIGIBILITY**

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

### **DISBURSEMENT**

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

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- All students who receive financial aid are required to abide by the policies and regulations of Trine University.
- All Trine University financial aid policies and fund rules are either published on our website or available in our office. Aid recipients are required to be familiar with these policies. Information that is unclear should be brought to the attention of a financial aid staff member.
- The Office of Financial Aid will process financial aid requests without regard to race, religious affiliation, gender, age, or disability. All funds are subject to individual student need as well as the availability of funds.
- General information is communicated to students through their student e-mail account and financial aid information is communicated through their MyTrineFa account. It is recommended that students review their accounts daily. \*\*For new students we use the email that was entered in on the FAFSA but after they receive their student email account we begin to communicate using that one.
- The student has the right to know what types of aid are available. That information is available on both our website and in our offices.
- Students are obligated to advise the Office of Financial Aid of any name, address, or phone number changes. Updating this information through the MyPortal will not update your financial aid records.
- Financial aid recipients are required to notify the Office of Financial Aid of any scholarships, loans, book allowances, employer assistance or other forms of assistance extended to them from sources outside the college. Adjustments of aid may occur as a result.
- The Office of Financial Aid reserves the right, on behalf of the Institution, to review and cancel any award at any time because of changes in a student's financial or academic status, state program rules, federal program rules or any other significant change. Students will be notified of any changes to their aid via an email communication to their Trine email account (refer to \*\* in #3 for new students). The email will include instructions on how to access MyTrineFA and review the changes. This will only show the changes made to your award notification and not your bill. If you want to know how this change will affect your bill you will need to log into your MyPortal account for that information.
- Financial aid is awarded to a student contingent upon maintaining standards set forth by the institution's Title IV Satisfactory Academic Progress (SAP) policies which complies with required Federal standards. Please refer to our website and/or student handbook for policy details.
- Disbursement of a student's financial aid award(s) (with the exception of CWS- College Work Study) will be in the form of a direct payment to the student's account in the Business Office. Work-study earnings are paid directly to the student on a bi-weekly basis via direct deposit after a job is secured and hours are worked.
- Financial aid will be awarded and disbursed based on full-time enrollment. Should the student register for less than a full-time course load or drop classes that adjusts enrollment, costs and aid will be adjusted and an acknowledgement will be sent to the student via email communication. In some cases, students may be required to repay funds to the University.
- It is the student's responsibility to ensure that their tuition is paid in full by the due date either by financial aid, payment plan, cash or whatever resource they plan to use. Students can check their account status on My Portal.
- The student must complete all application forms accurately and submit them on time to the appropriate location.

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- The student must provide correct information. The intentional misreporting of information on financial aid application forms is a violation of the law and is considered a criminal offense which could result in indictment under the U.S. Criminal Code.
- The student must return all additional documentation, verification, corrections, and/or new information requested by the Financial Aid Office in a timely manner. Any delay can affect eligibility for certain types of aid.
- A student receiving federal financial aid earns their aid based on the number of days that they attend class. A recipient who fully withdraws from Trine University before 60% of the term is completed will be subject to an aid recalculation based on the number of days attended. The unearned aid will be refunded to the appropriate federal financial aid program by the institution and the student will repay the institution.
- A student receiving state financial aid earns those funds based on their enrollment at the end of the 28th class day. Therefore state aid will be affected should the student drop all of their coursework or below full-time before that date.
- A student receiving a Federal Pell Grant earns those funds based on their enrollment as a first time bachelor degree seeking student. A student needs to begin enrollment in all of their coursework before Pell Grants will disburse to their student account. Therefore Pell Grants will be affected if you do not begin your enrollment in all of your coursework and/or drop some or all of the coursework for which you enrolled in.
- A student may be awarded employment under the CWS – Federal Work Study Program. The amount of CWS aid shown on the award letter is the maximum amount of money the student can expect to earn during the academic year as a result of work performed. The student will only be paid for hours worked and obtaining work is contingent on finding CWS approved employment.
- Financial aid awards are made for one academic year only. One half of the award will be applied each semester. It is always the student's responsibility to apply annually for aid; applications submitted by March 1st will receive priority consideration. Renewal of aid depends upon the student maintaining Title IV Satisfactory Academic Progress, continued need for financial aid assistance and the availability of funds.
- Students planning to attend summer semester and wishing to receive financial aid must complete a Request for Summer Aid Form in addition to the FAFSA. Applications are available on-line and in the Office of Financial Aid following spring break.
- Students who are incarcerated in a state or federal correctional institution are required by Federal law to inform the aid office of their incarceration.
- The student is responsible for reading and understanding all forms that he/she is asked to sign and for keeping copies of the forms.
- The student must accept responsibility for all agreements that he/she signs.
- The student must be aware of and comply with the deadlines for application or reapplication for aid.
- The student should be aware of the school's refund policy
- Students receiving financial aid must inform the Office of Financial Aid about additional awards
- Students must maintain satisfactory academic progress toward academic goals.
- Students must maintain good social standing.
- Students must reapply for financial aid between January 1 and March 1.
- Students must report to the Office of Financial Aid when transferring to another school.

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- 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, 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 who are married and under 21 years of age on or before the first day of fall classes must show a marriage license and live with the spouse in a permanent location within 40 miles from Angola, IN. In addition, International students must show dependent I-20 or dependent DS-2019. Students who are responsible for a dependent child and under 21 years of age on or before the first day of fall classes must show a State issued birth certificate.

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

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

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

## **UNIVERSITY DISCIPLINARY REVIEW BOARD PROCESS**

Information regarding disciplinary processes can be found in the [Student Handbook](#).

## **STUDENT FORMAL COMPLAINT PROCEDURE - "NOTICE OF COMPLAINT"**

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

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

### **The Complaint Process**

There are four steps to the complaint process:

#### **1. Notice of Complaint**

The Notice of Complaint includes pertinent student information which is automatically populated on the form once the student begins the process. The following student information is included on the page: 1) date of submission; 2) name of the student and ID number; 3) local address of the student; 4) facts and documentation for the complaint; 5) phone number; 6) class status; 7) explanation of the complaint. Students must click the submit button to complete the process.



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### 2. Referral

Once submitted, the complaint is forwarded to the Referral Committee which consists of the President's Chief of Staff, the Executive Assistant to the Office of Academic Affairs, and the Assistant Vice President of Academics (ALO). This committee reviews the complaint and refers it to the appropriate vice president or administrator for action. To ensure confidentiality, only the Committee and the administrator will have access to the complaint information.

### 3. Solution.

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

### 4. Appeal.

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

## CAMPUS LIFE

For information on the following, please see the current [Student Handbook](#).

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

## **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**

### **CREDIT HOUR POLICY (DEFINITION OF CREDIT HOUR)**

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

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

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

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

<b>Credit Hours</b>	<b>Hours of Direct Instruction</b>	<b>Hours to Complete Additional Coursework</b>	<b>Total Hours</b>
1	15	30	45
2	30	60	90
3	45	90	135
4	60	120	180
5	75	150	225

#### *Determining Credit Hours in Different Delivery Modes*

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

#### *Note on Laboratory Courses:*

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

#### *Guidelines for Delivery Modes*

- *Face-to-face:*
  - *15 week courses:* Adhere to the policy above.
  - *8 week courses:* Required readings, viewing of/listening to recorded lectures, or engagement in other online/electronic direct instruction methods is expected to equal 15 hours per credit hour. Students' work, including the completion of assessment activities and other assignments is expected to equal 30 hours per credit hour.

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

### *Note on Summer Terms*

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

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

### *Note on International Partnerships:*

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

## **MINIMUM CREDIT HOURS FOR DEGREES AND MINORS**

In accordance with the assumed practices of the Higher Learning Commission, the minimum program length for associate degrees is 60 semester credits. For bachelor's degrees the minimum is 120 semester credits, and for master's degrees it is 30 semester credits beyond the bachelor's degree. Further, Trine University defines the minimum program length for minors as 15 semester credit hours.

## **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.

## **DISTANCE LEARNING**

Seated courses are taught in a face-to-face classroom setting. The syllabus, course schedule, and other materials are to be posted online and students may be asked to submit some work electronically. However a number of distance learning modes are available. Distance Learning (DL) includes fully online or blended courses and is a formal educational process in which the majority of the instruction (interaction between students and instructors and among

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students) in a course occurs when students and instructors are not in the same place. Instruction may be synchronous or asynchronous. Interaction between the instructor and the student is regular and substantive. Distance Learning (DL) includes various delivery methods.

### Delivery Mode

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

1. DL - Online courses are taught 100% online through the main use of asynchronous activities providing greater flexibility of schedule and convenience of access to students, while allowing them to meet the same learning outcomes and level of rigor achieved in seated courses. The delivery of online exams will follow university-approved processes. Some online courses also include the authentication of online test takers and the use of online proctoring tools or live local proctors.
  - a. Respondus LockDown Browser is a custom web browser that “locks down” the testing environment within Moodle LMS. Once inside LockDown Browser, students are prohibited by the software from printing, copying & pasting, visiting external websites, and accessing other software applications during the examination process. Any open software applications which LockDown perceives as intrusive to the exam process (i.e. Skype, AOL Instant Messenger, etc.) are required to be closed before the examination process is allowed to proceed.
2. DL - Hybrid courses take advantage of the best features of seated classroom instruction and online education. Students meet face-to-face for 50% or more of the course and complete the rest of their coursework online. A hybrid course is not simply an online course that requires in-class exams. Hybrid courses allow faculty and students both the opportunity to build strong personal relationships through face-to-face interaction and the opportunity to explore new types of learning activities that were not possible in seated courses. Dates, times and locations for face-to-face meetings will be published in the official course schedule.
3. DL - Video Conferencing courses are taught face-to-face (either in person or via videoconference) in classrooms specially equipped that allow live interaction between the instructor and students even though they may be in classrooms in different geographic locations or remote campuses. Dates, times, and locations for class meetings will be published in the official course schedule.

### 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.

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

When a student changes his or her major, all transcripts, including the Trine University transcript, are evaluated by the new Chair. If the change of major is from one school to another, from a four-year to a two-year program, or from a two-year to a four-year program, courses with less than a “C” grade may be dropped from the student’s cumulative totals, if the courses

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are not required in the new major. This includes students in the Allen School of Engineering and Computing who change from an engineering major to Design Engineering Technology. Dropped courses may not be repeated in the new major.

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

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

### **CHANGING A MAJOR (COLLEGE OF GRADUATE AND PROFESSIONAL STUDIES)**

To change a major, students must get the approval of the Education Center Director or assigned faculty advisor. 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

**Category 2:** Arts & Sciences degrees

**Category 3:** Engineering and Technology degrees

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

Additional conditions:

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

### **CONDITIONAL STUDENTS DECLARING A MAJOR**

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

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

*Allen School of Engineering and Computing:*

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

*Franks School of Education*

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

*All other schools:*

- Minimum of a 2.0 GPA

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### **FULL-TIME UNDERGRADUATE STUDENT OVERLOAD OF CREDIT HOURS**

A full-time undergraduate student is one who is carrying a minimum of 12 academic credit hours. If a main campus student wishes to register for more than 18 credit hours, he or she must have written permission as follows:

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

### **CLASSIFICATION OF STUDENTS**

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

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

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

### **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. Students wishing to change from non-degree status to a degree program should apply for admission through the Office of Admission. For information regarding Dual Enrollment please reference [Degree Seeking Students in Dual Enrollment](#).



## **GENERAL EDUCATION REQUIREMENTS**

### **GENERAL EDUCATION PHILOSOPHY**

The purpose of the general education curriculum components is to provide the Trine University graduate with skills necessary to think critically and to communicate clearly with persons in all professions. The General Education requirements are designed to ensure breadth of knowledge and to promote intellectual inquiry 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.
- 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
<b>Written Communication</b>	<b>6</b>
ENG 103 and one of the following: ENG 113, ENG 133 or COM 213	
<b>Oral Communication</b>	<b>3</b>
SP 203 or COM 163	
<b>Humanities &amp; Social Sciences</b>	<b>12</b>
Take at least two courses from Social Sciences and at least two courses from Humanities. (See table that follows.)	
<b>Mathematics &amp; Science</b>	<b>9</b>
Must include at least one course in mathematics and one course in science	
<b>Other*</b>	
<u>Additional hours to be taken from the above categories</u>	<u><b>12</b></u>
<b>TOTAL</b>	<b>42</b>

\*EXS 102 – Lifetime Wellness may be used to satisfy two of the twelve “Other” hours.  
HNR 121 – Introduction to Honors Seminar may be used to satisfy one hour of the twelve “Other” hours. Any approved computer literacy course may be used to satisfy three of the twelve “Other” hours under General Education requirements.

**FOREIGN LANGUAGE POLICY**

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

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

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

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

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

Area	# of semester hours
<b>Written Communication</b> ENG 103 and one of the following: ENG 113, ENG 133 or COM 213	<b>6</b>
<b>Humanities &amp; Social Sciences</b> (See table that follows.)	<b>6</b>
<b>Mathematics &amp; Science</b>	<b>6</b>
<b>Other**</b>	<b>4</b>
<b>TOTAL</b>	<b>22</b>

\*Except those in Applied Science (see the following page)

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

**FOREIGN LANGUAGE POLICY**

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

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

**GENERAL EDUCATION REQUIREMENTS FOR ASSOCIATE  
IN APPLIED SCIENCE DEGREES**

<b>Area</b>	<b># of semester hours</b>
<b>Written Communication</b> ENG 103 and one of the following: ENG 113, ENG 133, COM 213, SP 203 or COM 163	<b>6</b>
<b>Humanities &amp; Social Sciences</b> (See table that follows.)	<b>3</b>
<b>Mathematics &amp; Science</b>	<b>6</b>
<b>TOTAL</b>	<b>15</b>

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

**FOREIGN LANGUAGE POLICY**

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

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

**HUMANITIES AND SOCIAL SCIENCES FOR BACHELOR & ASSOCIATE DEGREES**

Humanities		Social Sciences	
ARC 293	FLM 203	COM 123	POLS 113
ART 253	FRN 113	ECO 213	POLS 313
CHN 113	FRN 123	ECO 223	POLS 333
CHN 123	GER 104	ECO/SOC 243	POLS/PSY 373
COM 203	GER 114	ECO 323	PSY 113
COM 233	GER 203	ECO 383	PSY 223
COM 363	GER 213	EDU 222	PSY 313
ENG 1003*	HIS 253	EDU 232	PSY 323
ENG 153	HNR X1X	EDU 473	PSY 333
ENG 204	MUS 123	GEO 213	PSY/SOC 343
ENG 233	MUS 223	GEO 303	PSY 353
ENG 214	MUS 272	GEO 313	PSY 383
ENG 253	MUS 273	GEO 323	PSY 403
ENG 263	PHL 203	HIS 103	PSY 413
ENG 273	PHL 251/HIS 251	HIS 113	SM 393
ENG 323	PHL 313	HIS 203	SOC 103
ENG 333	PHL 323	HIS/POLS 323	SOC 313
ENG 363	PHL 333	HIS/POLS 343	SOC 323
ENG 403	PHL 343	HIS/POLS 363	SOC 333
ENG 423	SPN 103	HIS/POLS 403	WS 103
ENG 433	SPN 113	HIS 213	
ENG 443	SPN 123	HIS/PHL 251	
ENG 2013	SPN 203	HIS 263	
ENG 2023	SPN 213	HIS/POLS 423	
ENG 2113	THE 103	HIS 433	
ENG 2123		HNR X2X	
ENG 3303			
ENG 3313			

\*Humanities elective for international students ONLY

## **UNDERGRADUATE 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. If an "I" or "IP" grade is not removed until after the start of the next semester, the graduation date will reflect the new semester.
5. Candidates for graduation must file with the registrar, intent to graduate no later than one semester before the final semester of attendance in which degree requirements shall be completed.
6. CHAT (Culture, Humanities, and the Arts at Trine) Main Campus graduation requirement: Students must attend eight university-approved CHAT events over the course of four years, or one per semester while enrolled, with no limitations on the number of events per semester. Transfer students are required to attend a prorated number of events, dependent upon the number of semesters they are enrolled, at one per semester.

### **COMMENCEMENT PARTICIPATION FOR UNDERGRADUATE STUDENTS**

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

### **COURSE SUBSTITUTIONS**

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

### **ACADEMIC RESIDENCY REQUIREMENT**

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

## **SECOND DEGREE, SECOND MAJOR, AND MINORS**

### **SECOND DEGREE**

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

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

### **SECOND MAJOR**

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

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

### **ACADEMIC MINORS (MAIN CAMPUS)**

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

## **SCHOLASTIC AWARDS**

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

**THE PRESIDENT'S LIST:** A student whose semester grade point average is 3.750 or better, while carrying at least 15 undergraduate credit hours (main campus) or 12 undergraduate credit hours (CGPS), will be placed on the President's List.

**THE DEAN'S LIST:** A student whose semester grade point average is between 3.500 and 3.749, while carrying at least 15 undergraduate credit hours (main campus) or 12 undergraduate credit hours (CCPS), will be placed on the Dean's List.

### **SCHOLASTIC AWARDS AT GRADUATION**

**GOLD KEYS:** Gold Keys are awarded to bachelor degree students who are named to the President's List in four consecutive semesters. Main campus students must be enrolled in a minimum of 15 undergraduate credit hours to be named to the President's List. CGPS students must be enrolled in a minimum of 12 undergraduate credit hours.

**PRESIDENTIAL GOLD KEYS**

Presidential Gold Keys are awarded to students who earn a Gold Key and then are named to the President’s List an additional four consecutive semesters. Main campus Presidential Gold Key awardees may be enrolled in 12 undergraduate credit hours in their final semester.

**SILVER KEYS**

Silver Keys are awarded to associate degree students who are named to the President’s List for two consecutive semesters. Main campus students must be enrolled in a minimum of 15 undergraduate credit hours to be named to the President’s List. CGPS students must be enrolled in a minimum of 12 undergraduate credit hours.

**GRADUATION WITH HONORS**

The grid below details the levels of academic honors listed on the student’s diploma and transcript.

<b>LATIN HONORS</b>		<b>ACADEMIC HONORS</b>	
Minimum 40 undergraduate credit hours earned at Trine	<b>GPA</b>	Minimum 30-39 undergraduate credit hours earned at Trine	<b>GPA</b>
Cum Laude	3.500-3.749	Academic Honors	3.500-3.749
Magna Cum Laude	3.750-3.949	High Academic Honors	3.750-3.949
Summa Cum Laude	3.95-4.00	Highest Academic Honors	3.95-4.00

**HONORS DAY**

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



## UNDERGRADUATE 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	

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

## GRADUATE GRADING SYSTEM

### GRADE OF INCOMPLETE

(Issued only under special circumstances)

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

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

An “I” grade not removed for the main campus within one year from the end of the semester in which the “I” grade was issued will be converted to an “FI” grade by the registrar. For

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undergraduates in CGPS an “I” grade not removed within eight weeks in which the “I” grade was issued will be converted to an “F” 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 or regional director who will act on behalf of the former instructor. In the case of a graduating senior, if an “I” or “IP” grade is not removed until after the start of the next semester, the graduation date will reflect the new semester.

### **GRADE OF “IN PROGRESS”**

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

### **COURSE REPEAT**

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

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

### **FAILING GRADES**

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. Faculty members are responsible for informing students of their grading policy. Grades become official when they are reported to the Registrar. If a faculty member discovers incorrectly reported grades, the error should be reported to the Registrar immediately. The appropriate department chair/program director must approve any adjustment of grades.

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

- 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 department chair/program director.
- If the department chair/program director mediation does not resolve the issue, the student should file a written appeal to the appropriate academic 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

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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. One regular member shall be chosen 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 or Designated School Official (DSO) if they will be dropping below 12 credit hours.

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

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

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

## **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.

## **CLASS ATTENDANCE AND EXCUSED ABSENCES**

### **Main Campus**

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

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

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

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

Online courses follow the CGPS attendance policy as stated below.

### **College of Graduate and Professional Studies**

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

## 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. Failure to adhere to the policy above is considered academic misconduct.

**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 below for further explanation of required GPA.)

Students are placed on probation in the following situations:

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

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

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

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

Financial aid is not automatically reinstated when a dismissed student is readmitted. Students on academic probation will have the following restrictions placed on their attendance:

- You are required to register for UE 201, Success Skills and Reflection.
- You may not register for more than 15 credit hours. If you wish to take more, you must petition the Readmit/Probation Committee for permission.
- You may not participate in the “rush” system for any fraternity or sorority.
- If you are an athlete, you are NOT eligible to participate in any competition.

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

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

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

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

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

### **ACADEMIC 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
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.

## WITHDRAWAL FROM THE UNIVERSITY

### **VOLUNTARY**

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

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 Student Success and Retention.

### **UNAUTHORIZED**

A student leaving the University during a term without officially withdrawing will receive “F” grades in all courses and will not receive refunds of any kind, including fees and deposits. The withdrawal procedure will not take place automatically for a student who leaves campus because of illness or family emergency. If official notification of withdrawal cannot be made in person, the student should contact the registrar in writing.

### **DISCIPLINARY**

Students dismissed for disciplinary reasons during a term 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](#)).



## ADMINISTRATIVE DISMISSAL POLICY

### *Disciplinary Dismissal*

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

### *Excessive Absence Dismissal*

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

## 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.

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

## TRANSCRIPTS

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

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

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

## RELEASE OF STUDENT INFORMATION - FERPA

The Family Educational Rights and Privacy Act (FERPA) affords eligible students certain rights with respect to their education records. (An “eligible student” under FERPA is a student who is 18 years of age or older, or who attends a postsecondary institution. At 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.

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

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

The name and address of the Office that administers FERPA is:

Family Policy Compliance Office, U.S. Department of Education, 400 Maryland Avenue SW, Washington, DC 20202

## **ACADEMIC OPPORTUNITIES**

### **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). Dual Enrollment is a non-degree seeking program. Courses are offered in the following ways:

- On Trine University's main campus and at its educational centers. These courses enroll both Trine University students and high school students.
- Online
- On the campuses of participating high schools

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 complete 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 all applicable policies stated in both the Dual Enrollment Handbook and the Trine University Student Handbook.

#### **NON-DEGREE SEEKING STUDENTS in DUAL ENROLLMENT**

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

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)

Students whose scores do not meet the below requirements may be required to take ESL intensive courses.

### REQUIREMENTS – UNDERGRADUATE

International students who are seeking a degree must provide a score from the TOEFL (code is 1811), ACT (code is 1250) or SAT (code is 1811).

- IBT TOEFL 71
- IELTS 6.0 overall and a 5.0 minimum on any section.  
- [TOEFL/IELTS exemption qualification](#)
- PTE 50

The Trine University ESL courses are offered in 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 with “conditional admission” to a University degree program.

The intensive ESL courses strive 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.

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

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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.

#### **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 in their departments. Contract courses are a regularly offered Trine University course in which the instructor and honors student agree on additional requirements to enrich the experience. For HNR courses and honors sections of courses, the credits for each course will directly correlate to the number of points earned. Contract course points will vary depending on the degree of extra work involved. 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 John H. Paek, Major, USAF; 574.631.4676.

### **STUDY ABROAD PROGRAM**

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

Through Trine University's direct affiliation with International Studies Abroad (ISA), students can participate in affordable summer, semester, or year-long programs in Argentina, Australia, Belgium, Brazil, Chile, China, Colombia, Costa Rica, Czech Republic, Dominican Republic, England, Fiji, France, Germany, Greece, India, Ireland, Italy, Japan, Jordan, Morocco, New Zealand, Peru, Scotland, South Africa, South Korea, Spain, Thailand, and Turkey. Internships and study plus internship abroad combo options are also available

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at selected destinations. Further details including the cost, duration, dates, institutions, and course can be accessed at <https://studiesabroad.com>.

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

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

### **DPT 3+3 AND INTEGRATED UNDERGRADUATE/GRADUATE PROGRAMS**

These programs offer the opportunity for undergraduate students to begin work towards a graduate degree. For additional information please go to the [Student Classifications – Dual Undergraduate/Graduate](#) section.



# 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.**

1. Applicants whose native language is not English must provide evidence of a 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 coursework 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.
2. ENG 502, Critical Reading and Applications, is a pre-requisite course for international students who have not studied in the U.S. The course serves

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international students who are acquainted with the methods of critical reading but who need to refine and strengthen their skills in order to succeed in subsequent university courses. Students must successfully complete this course with a grade of “C” or higher in order to proceed to the next required English course in the program.

- 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.

## **SHARED PROGRESS**

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

## **STUDENT CLASSIFICATIONS – DUAL UNDERGRADUATE/GRADUATE**

### **1. 3 + 3 Degree Path – Doctorate of Physical Therapy (DPT) degree program**

Trine University offers a six year plan of study to qualified students leading to a bachelor degree in either exercise science or biology and a Doctorate of Physical Therapy. To be accepted into the program students must graduate HS with a 3.5 GPA, Graduate in the top 25% of their HS class (academically), and have an ACT score of at least 25 or an SAT score of at least 1150.

Throughout the first three years of this plan of study students must maintain a 3.5 cumulative GPA and upon completion of these three years they need to have 40 hours of physical therapy observation.

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. All institutional scholarships for undergraduate programs will not be available during years four, five, and six when they are considered a graduate student. Students are encouraged to investigate alternative funding opportunities to complete graduate school during these last years.

### **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 Computing, Ketner School of Business, or Jannen School of Arts & Sciences. These students will be changed to graduate status after earning their required undergrad credit hours, at which time they must have a cumulative grade point average of at least 3.0. Students who do not meet this standard will not be given graduate status and will be awarded the bachelor's degree when the bachelor's degree requirements are met. Students will be awarded each degree (BS and MS) upon completion of its respective degree requirements.

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

Accounting, Biomedical Engineering, Chemical Engineering, Civil Engineering, Criminal Justice, Communication, Electrical Engineering, Golf Management, Management, Marketing, Mechanical Engineering, or Sport Management.

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

### 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 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 of graduate course credit completed at a regionally accredited graduate school **may** be counted toward completion of a graduate degree at Trine University with a grade of B or above and with the approval of the Program Chair/Director and Dean. All other courses must be taken at Trine University. Transfer credit will not include a grade and, therefore, will not impact the student's GPA. Courses used to satisfy the requirements of a bachelor's degree cannot be applied to a master's degree. The final 15 credit hours must be received within Trine University. This policy does not apply to the 3+3 Doctorate of Physical Therapy 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.

## GRADUATE GRADING SYSTEM

The grading system is as follows:

A	Excellent	4.0
B+	Very Good	3.5
B	Good	3.0
C+	Above Average	2.5
C	Average (lowest passing grade)	2.0
F	Failure	0.0
I	Incomplete	not figured into GPA
IP	In progress (grade deferred)	not figured into GPA
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.	

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

## 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 completed 75% of the course requirements, has a "C" or higher, 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

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

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

### **UNSATISFACTORY**

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

### **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.

## **ATTENDANCE POLICY**

### **ATTENDANCE**

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

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

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are absent from this scheduled meeting for any portion of the day will be administratively withdrawn from the course.

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

### **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**

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

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

Students whose cumulative GPA is below 3.0 and are on academic probation due to GPA, will not be eligible to participate in Curricular Practical Training (CPT) during the semester of

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probation. Students will regain eligibility once the academic probation has been lifted and they are in good academic standing of a 3.0 or higher.

### **GRADE APPEALS**

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



## **STUDENT GRIEVANCE PROCEDURE**

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

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

Anyone wishing to make a formal complaint must complete a Notice of Complaint found on the Trine University myPortal – Student Page, under Formal Complaint Form.

The Notice of Complaint will be filed with the VPAA's Office who will forward it to the appropriate parties.

### **Formal Grievance Process**

**Step One:** The Notice of Complaint will include the following student information:

1. The date of submission
2. The name of the student and his/her student ID number
3. The local address of the student
4. Facts and documentation supporting the nature of the complaint
5. The local phone number
6. Class status
7. Explanation of complaint

This request must be submitted before the completion of the term following the incident.

**Step Two:** The vice president for academic affairs (or designee) will review the complaint and forward the complaint to the appropriate vice president who will be responsible for meeting with the concerned student. Action must be taken within 10 class days. If filing an appeal, the response must be filed within 10 class days of receiving the response letter.

**Step Three:** If a hearing before the Grievance Committee is warranted, the vice president must respond 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 vice president within ten class days.

**Step Four:** The 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.

## **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 coursework will be used in an assessment process.

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

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

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

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

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### Level 1

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

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

#### Intervention

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

### Level 2

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

- Evidence suggests Student has made no attempt to improve integrity of work or students engaged in sustained or especially serious violation of academic integrity.

#### Intervention

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

### Level 3

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

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

#### Intervention

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

## DISMISSAL POLICY

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

- Program Director (to facilitate contact):
  - Associated Faculty
  - Director of Campus Safety (Issuance of No Trespass Order)
  - Angola Police Department (Issuance of No Trespass Order)

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- Vice President of Academic Affairs
- Executive Director of Office of International Studies

### **DISCIPLINARY DISMISSAL**

**A Disciplinary Dismissal** is an official determination canceling the student's registration at the university. In the instance of dismissal, all academic grades, for the current semester, 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 and the student's parents or guardians when a student is dismissed.

### **GRADE AND PROGRAM 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

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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.

### **DEGREES**

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

### **SEMESTER HOUR LOAD**

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

# **TRINE UNIVERSITY GRADUATE PROGRAMS**

**DOCTOR OF PHYSICAL THERAPY**

**MASTER OF PHYSICIAN ASSISTANT STUDIES**

**MASTER OF BUSINESS ADMINISTRATION**

**MASTER OF SCIENCE IN ENGINEERING MANAGEMENT**

**MASTER OF SCIENCE IN INFORMATION STUDIES**

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

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

## **DOCTOR OF PHYSICAL THERAPY**

The Doctor of Physical Therapy Program (DPT) will provide students with the skills and expertise needed for a rewarding career as a professional physical therapist.

Students enrolled in Trine University's DPT program will be required to participate in clinical education experiences and internships in addition to the didactic coursework within the curriculum. These experiences will include part-time integrated clinical 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.

The Doctor of Physical Therapy Program at Trine University is accredited by the Commission on Accreditation in Physical Therapy Education (CAPTE), 1111 North Fairfax Street, Alexandria, Virginia 22314; telephone: 703-706-3245; email: [accreditation@apta.org](mailto:accreditation@apta.org); website: <http://www.capteonline.org>.

**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	5361	Outcome Assessment	(1)
DPT	5343	Clinical Practice III	(3)
DPT	5372	Evidence Based Practice I	(2)
DPT	5381	Integumentary System	(1)
DPT	6111	CARE IV	(1)
DPT	6124	Musculoskeletal PT I	(4)
DPT	6134	Neuromuscular PT I	(4)
DPT	6142	Imaging & Laboratory Testing	(2)
DPT	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 & 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	First Full-time Clinical Education Experience	(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	Terminal Full-time Clinical Education Experience I (8wks)	(8)
DPT	7128	Terminal Full-time Clinical Education Experience II (8wks)	(8)
DPT	7214	Terminal Full-time Clinical Education Experience III	(14)
DPT	7262	Professional Development III	(2)

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



## **MASTER OF PHYSICIAN ASSISTANT STUDIES**

The Master of Physician Assistant Studies\* at Trine University is a seven semester program designed to prepare students to succeed, lead and serve the community and the physician assistant (PA) profession. The PA program will be the beginning of a lifelong journey in the pursuit of knowledge, professional development, and personal growth. The program is also committed to maintaining the highest moral and ethical standards.

The PA program is a 117 credit hour 7 semester curriculum of approximately 29 months divided into didactic and experiential phases.

### **DIDACTIC PHASE**

The didactic phase of the PA program comprises of four semesters and includes a total of 66 credit hours. Although primarily campus-based, students occasionally need to travel to clinical application obligations, including local interprofessional education activities.

### **EXPERIENTIAL PHASE (CLINICAL YEAR)**

The clinical phase of the PA program encompasses approximately three semesters and is organized into nine 5-week clinical rotation periods. Students will be required to return to campus once every approximately five weeks for end-of-rotation activities and will also return to campus for the last two weeks of the final semester. Not all clinicals are local or a driving distance from campus. Students are responsible for their own travel and housing expenses and should expect to travel for one to two experiences. Students are not eligible for experiential phase courses until they have successfully completed all didactic phase courses. Concurrent with the clinical experiences are the Senior Seminar and Graduate Project course series.

There are seven program-required rotation areas and opportunities for elective experiences.

Required are rotations in:

- Family Medicine (5 weeks)
- Internal Medicine (5 weeks)
- Emergency Medicine (5 weeks)
- General Surgery (5 weeks)
- Women's Health (approximately 2.5 weeks)
- Pediatrics (approximately 2.5 weeks)
- Behavioral Health (approximately 2.5 weeks)

Elective rotations include (depending on preceptor availability):

- Orthopedics
- Plastic Surgery
- Hematology
- Genitourinary
- Gastroenterology
- Otorhinolaryngology
- Dermatology

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- Cardiology
- Miscellaneous

*\*The ARC-PA has granted **Accreditation-Provisional** status to the Trine University Physician Assistant Program sponsored by Trine University. Accreditation-Provisional is an accreditation status granted when the plans and resource allocation, if fully implemented as planned, of a proposed program that has not yet enrolled students appear to demonstrate the program's ability to meet the ARC-PA Standards or when a program holding Accreditation-Provisional status appears to demonstrate continued progress in complying with the Standards as it prepares for the graduation of the first class (cohort) of students. Accreditation-Provisional does not ensure any subsequent accreditation status. It is limited to no more than five years from matriculation of the first class.*

**MASTER OF PHYSICIAN ASSISTANT STUDIES****117 HRS.****DIDACTIC PHASE****66 Hours****Fall 1 (16 weeks – 17 credit hours)**

PAS 5001 Clinical Genetics	(1)
PAS 5002 Diagnostic Techniques I – Laboratory Medicine	(2)
PAS 5003 Clinical Physiology	(3)
PAS 5004 Clinical Anatomy	(4)
PAS 5012 Clinical Skills I – Medical Documentation & Interviewing	(2)
PAS 5022 PA Professional Practice	(2)
PAS 5052 Clinical Application & Reflection Experience I	(2)
PAS 5161 Clinical Pharmacology I	(1)

**Spring 1 (16 weeks – 18 credit hours)**

PAS 5102 Clinical Skills II – Physical Exam & Documentation	(2)
PAS 5110 Clinical Medicine & Therapeutics I	(10)
PAS 5112 Clinical Diagnostics II - EKG	(2)
PAS 5152 Clinical Application & Reflection Experience II	(2)
PAS 5171 Evidence Based Practice	(1)
PAS 5261 Clinical Pharmacology II	(1)

**Summer 1 (12 weeks – 13 credit hours)**

PAS 5205 Clinical Medicine & Therapeutics II	(5)
PAS 5212 Clinical Skills III – Special Populations	(2)
PAS 5213 Clinical Skills III – Imaging & PFTs	(3)
PAS 5252 Clinical Application & Reflection Experience III	(2)
PAS 5361 Clinical Pharmacology III	(1)

**Fall 2 (16 weeks – 18 credit hours)**

PAS 5310 Clinical Medicine & Therapeutics III	(10)
PAS 5315 Clinical Skills IV – Procedures	(5)
PAS 5352 Clinical Application & Reflection Experience IV	(2)
PAS 5371 Evidence Based Practice II	(1)

**EXPERIENTIAL PHASE (CLINICAL YEAR)****6 Hours**

PAS 6141 Senior Seminar I	(1)
PAS 6241 Senior Seminar II	(1)
PAS 6341 Senior Seminar III	(1)
PAS 6171 Graduate Project I	(1)
PAS 6271 Graduate Project II	(1)
PAS 6371 Graduate Project III	(1)

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<b>SUPERVISED CLINICAL PRACTICE EXPERIENCES (SCPE)</b>	<b>45 Hours</b>
<b>Spring 2</b>	
PAS 6015 Clinical Practicum 1	(5)
PAS 6025 Clinical Practicum 2	(5)
PAS 6035 Clinical Practicum 3	(5)
<b>Summer 2</b>	
PAS 6045 Clinical Practicum 4	(5)
PAS 6055 Clinical Practicum 5	(5)
PAS 6065 Clinical Practicum 6	(5)
<b>Fall 3</b>	
PAS 6075 Clinical Practicum 7	(5)
PAS 6085 Clinical Practicum 8	(5)
PAS 6095 Clinical Practicum 9	(5)
<b>TOTAL</b>	<b>117 HRS.</b>

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## **MASTER OF BUSINESS ADMINISTRATION**

The Master of Business Administration (MBA) offered through College of Graduate Studies is focused on delivering real world return on investment for professionals seeking to develop their skills and marketability in business and finance.

### Experiential Track

In the Experiential Track, an internship experience is an integral part of the program of study. Therefore, international students (F-1) admitted to the Experiential Track are required to be enrolled immediately in an internship course for credit, and be engaged in an active internship experience, whether full or part-time.

### Non-Experiential Track

In the Non-Experiential Track, international graduate students (F-1) must have been enrolled for one academic year in order to apply for work/internship authorization (CPT).

- **Program Educational Objectives:**

The program has established the following educational objectives:

1. 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 communication 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 strategic thinking processes 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 of print, video, and social media communications
- 3.3 Tools for managing business information systems

**MASTER OF BUSINESS ADMINISTRATION**

**30 HRS.**

**PROGRAM REQUIREMENTS**

**REQUIRED HOURS**

**BA 5000 Introduction to MBA**

**0 HRS.**

*Only for students that **do not** have an undergraduate degree in Business, Accounting, or Finance.*

**PROGRAM CORE COURSES**

**21 HRS.**

BA	5223	Executive Communication	(3)
BA	6933	Statistics & Quantitative Methods	(3)
BA	6963	Business Administration Capstone	(3)
FIN	5063	Corporate Finance	(3)
FIN	6923	Managerial Accounting & Finance	(3)
ECO	5033	Micro & Macro Economic Decision Making	(3)
MK	6943	Strategic Marketing & Management	(3)

**ELECTIVES (CHOOSE 9 HOURS FROM THE COURSES BELOW)**

**9 HRS.**

AC	533	Corporate Taxation	(3)
AC	553	Federal Taxation of Pass-Through Entities	(3)
AC	5003	Advanced Auditing	(3)
AC	5013	Managerial Accounting	(3)
BA	5103	Business Ethics	(3)
FIN	5823	Financial Modeling	(3)
FIN	5833	International Finance	(3)
FIN	5843	Financial Markets & Institutions	(3)
FIN	5853	Investment Analysis & Portfolio Analysis	(3)
GE	5103	Project Management	(3)
GE	5113	New Product Development & Innovation Strategies	(3)
GE	5133	Lean Six Sigma	(3)
HR	5923	Strategic Human Resource Management	(3)

**TOTAL**

**30 HRS.**

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## MASTER OF SCIENCE IN ENGINEERING MANAGEMENT

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

### Experiential Track

In the Experiential Track, an internship experience is an integral part of the program of study. Therefore, international students (F-1) admitted to the Experiential Track are required to be enrolled immediately in an internship course for credit, and be engaged in an active internship experience, whether full or part-time.

### Non-Experiential Track

In the Non-Experiential Track, international graduate students (F-1) must have been enrolled for one academic year in order to apply for work/internship authorization (CPT).

- **Program Educational Objectives:**

The program has established the following educational objectives:

1. 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 communication 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 strategic thinking processes 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**

**30 HRS.**

**CORE COURSES**

**21 HRS.**

BA	5103	Business Ethics	(3)
BA	5223	Executive Communication	(3)
BA	6933	Statistics & Quantitative Methods	(3)
FIN	5203	Finance for Engineers	(3)
GE	5113	New Product Development & Innovation Strategies	(3)
GE	5103	Project Management	(3)
MGT	5093	Business Strategy & Decision Making	(3)

**PROGRAM ELECTIVES (CHOOSE 9 HOURS FROM BELOW)**

**9 HRS.**

GE	5093	Design Thinking	(3)
GE	5133	Lean Six Sigma	(3)
GE	5163	Engineered Quality	(3)
LAW	5003	Law & the Engineering Professional	(3)
MGT	543	Operations Strategy & Management	(3)
MGT	5013	Advanced Plant Management	(3)

**TOTAL**

**30 HRS.**

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## MASTER OF SCIENCE IN INFORMATION STUDIES

The Master of Science in Information Studies (MSIS) offered through Trine University is focused on providing students with an opportunity to develop technological leadership in the analysis, design, development, maintenance and operation of information systems. The Master of Science in Information Studies will require 30 credit hours.

### Experiential Track

In the Experiential Track, an internship experience is an integral part of the program of study. Therefore, international students (F-1) admitted to the Experiential Track are required to be enrolled immediately in an internship course for credit, and be engaged in an active internship experience, whether full or part-time.

### Non-Experiential Track

In the Non-Experiential Track, international graduate students (F-1) must have been enrolled for one academic year in order to apply for work/internship authorization (CPT).

- **Program Educational Objectives:**

The program has established the following educational objectives:

1. Utilize managerial processes and tools for effective management and leadership.
2. Assess and leverage the impact of information technology to enhance business competitiveness and optimize business management.
3. Develop professional communication 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 strategic thinking processes 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 information systems for decision-making
- 2.4 Understanding of information system optimization concept management
- 3.1 Effective public speaking at team, group, and company level
- 3.2 Managerial level understanding of print, video, and social media communications
- 3.3 Tools for managing business information systems

**MASTER OF SCIENCE IN INFORMATION STUDIES**

**30 HRS.**

**PROGRAM REQUIREMENTS**

**30 HOURS**

GE	5103	Project Management	(3)
FIN	5203	Finance for Engineers	(3)
INF	503	Advanced Database	(3)
IS	5103	Object-Oriented Programming in Java	(3)
IS	5113	Data Mining & Data Visualization	(3)
IS	5203	Network Management	(3)
IS	5213	Data Science & Big Data	(3)
IS	5403	Cybersecurity	(3)
IS	5803	Information Studies Capstone	(3)
BA	6933	Statistics & Quantitative Methods	(3)

**TOTAL**

**30 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 of 13 courses offered online or on campus that can be completed in 12 months. Courses consist of eight week terms.

Pursuing this degree could open doors for students to pursue a variety of opportunities. Whether they plan to enhance their career in criminal justice, teach, or pursue their doctorate, a degree from Trine will give students the competitive edge they need to be successful.

The Master of Science with a major in Criminal Justice degree program is open to persons holding bachelor's degrees from regionally accredited institutions of higher learning and those approved by the program director.

An undergraduate degree in criminal justice is preferred; however, if the undergraduate degree is other than criminal justice, a core of criminal justice prerequisite courses may be required. At the discretion of the CGPS Director of Criminal Justice, these course prerequisites may be waived for applicants who have exemplified outstanding academic credentials at the undergraduate level, or for those applicants with a significant amount of documented professional experience with a criminal justice agency.

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

**36 HRS.**

**PROGRAM REQUIREMENTS**

**REQUIRED HOURS**

**CRIMINAL JUSTICE CORE**

**18 HRS.**

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

**CRIMINAL JUSTICE CAPSTONE**

**6 HRS.**

CRJ	593	Demonstration Project Capstone	(3)
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**TAKEN LAST TERM (CHOOSE ONE):**

**(3)**

FPY	693	Forensic Psychology Demonstration Project	
		or	
LAW	693	Law Concentration Demonstration Capstone	
		or	
LE	693	Law Enforcement Leadership Demonstration Capstone	

**SELECT 12 HOURS FROM THE FOLLOWING ELECTIVES:**

**12 HRS.**

CRJ	643	Law and Public Policy	(3)
FPY	603	Theory & Practice of Forensic Psychology	(3)
FPY	613	Psychopathology	(3)
FPY	623	Evaluation & Treatment of Specialized Populations	(3)
FPY	643	Victimology	(3)
LAW	603	Advanced Employment Law	(3)
LAW	613	Advance Criminal Procedure: Investigation & Adjudication	(3)
LAW	623	Children & the Law	(3)
LDR	5083	Conflict Resolution for Leaders	(3)
LE	603	Theory and Philosophy of Leadership for Law Enforcement	(3)
LE	613	Ethics, Culture & Politics	(3)
LE	643	Budget & Finance for Law Enforcement Leadership	(3)

**TOTAL**

**36 HRS.**

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

The Lou Holtz Master of Science in Organizational Leadership (MSOL) 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 MSOL develops the theoretical and applied leadership knowledge, capabilities and characteristics needed to positively impact organizations across multiple sectors.

**LOU HOLTZ MASTER OF SCIENCE IN ORGANIZATIONAL LEADERSHIP  
30 HRS.**

<b>PROGRAM REQUIREMENTS</b>			<b>REQUIRED HOURS</b>
<b>LEADERSHIP</b>			<b>30 HRS.</b>
LDR	5003	Leadership Philosophy	(3)
LDR	5023	Decision Making for Leadership	(3)
LDR	5043	Organizational Systems & Cultures	(3)
LDR	5063	Organizational Development & Change	(3)
LDR	5083	Conflict Resolution for Leaders	(3)
LDR	5203	Leadership Ethics	(3)
LDR	5223	Organizational Communication for Leaders	(3)
LDR	5253	Technology Topics for Leaders	(3)
LDR	5333	Research Methods	(3)
LDR	6563	Organizational Leadership Capstone	(3)
<b>TOTAL</b>			<b>30 HRS.</b>

## **TRINE UNIVERSITY MINORS**

Trine University minors are open to all main campus undergraduate bachelor degree seeking students. Some minors are restricted to specified majors, as indicated in the minor description. Full minor descriptions are found in the pages that follow.

- **ACCOUNTING (KSB)**
- **AERONAUTICAL ENGINEERING (ASOEC)**
- **ATHLETIC TRAINING (RRHS)**
- **BIOLOGY (RRHS)**
- **BIOMEDICAL ENGINEERING (ASOEC)**
- **BIOPROCESS ENGINEERING (ASOEC)**
- **BUSINESS (KSB)**
- **CHEMISTRY (RRHS)**
- **COACHING (RRHS)**
- **COMMUNICATION (JSAS)**
- **CRIMINAL JUSTICE (JSAS)**
- **DATA SCIENCE (ASOEC)**
- **ENERGY ENGINEERING (ASOEC)**
- **ENGLISH (JSAS)**
- **ENTREPRENEURSHIP (FOR BUSINESS STUDENTS) (KSB)**
- **ENTREPRENEURSHIP (FOR NON-BUSINESS STUDENTS) (KSB)**
- **ENVIRONMENTAL ENGINEERING (ASOEC)**
- **EXERCISE SCIENCE (RRHS)**
- **FINANCE (KSB)**
- **FORENSIC PSYCHOLOGY (JSAS)**
- **GAMING AND ESPORTS (RRHS)**
- **THOMAS AND JOY LACOUR GOLF MANAGEMENT (KSB)**
- **HISTORY (JSAS)**
- **LEADERSHIP (KSB)**
- **MANAGEMENT (KSB)**
- **MARKETING (KSB)**
- **MATHEMATICS (JSAS)**
- **METALLURGICAL ENGINEERING (ASOEC)**
- **MUSIC (JSAS)**
- **PLASTICS ENGINEERING (ASOEC)**
- **POLITICAL SCIENCE (JSAS)**
- **PSYCHOLOGY (JSAS)**
- **ROBOTICS (ASOEC)**
- **SOCIAL INNOVATION (KSB)**
- **SOFTWARE ENGINEERING (ASOEC)**
- **SPANISH (JSAS)**
- **SPORT PSYCHOLOGY (JSAS)**
- **STRUCTURAL ENGINEERING (ASOEC)**

ASOEC = Allen School of Engineering and Computing

KSB = Ketner School of Business

JSAS = Jannen School of Arts and Sciences

RRHS = Rinker-Ross School of Health Sciences

<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	Advanced Managerial Finance	(3)
AC or FIN Electives 300 level or above (including graduate courses)			(6)
<b>TOTAL IN MINOR PROGRAM</b>			<b>24 HRS.</b>

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**AERONAUTICAL ENGINEERING MINOR** **30 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 in MAE courses in the minor.

<b>REQUIRED ENGINEERING SCIENCE COURSES</b>			<b>6 HRS.</b>
ES	253	Electrical Science	(3)
ES	343	Heat Transfer	(3)
<b>REQUIRED MATHEMATICS COURSE</b>			<b>3 HRS.</b>
MA	313	Linear Algebra	(3)
<b>REQUIRED MECHANICAL ENGINEERING COURSES</b>			<b>18 HRS.</b>
MAE	3033	Fluid Dynamics for Mechanical Engineering	(3)
MAE	4023	System Dynamics & Controls	(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 & Control	(3)
<b>TOTAL IN MINOR PROGRAM</b>			<b>30 HRS.</b>

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**ATHLETIC TRAINING MINOR**

**15 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 coursework and training. Trine University does not certify athletic trainers.

EXS	243	Athletic Training	(3)
EXS	393	Advanced Athletic Training	(3)
EXS	423	Evaluation of Athletic Injuries	(3)
EXS	483	Professional Development in Exercise Science	(3)

**CHOOSE 3 CREDIT HOURS FROM THE FOLLOWING:**

EXS	203	Risk & Sports	(3)
EXS	273	Nutrition	(3)
EXS	343	Principles of Human Performance	(3)
SM	393	Sport Psychology (or other 200 or above PSY course)	(3)
SM	413	Organization & Administration of Physical Ed & Athletics	(3)

**TOTAL IN MINOR PROGRAM: 15 HRS.**

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**BIOLOGY MINOR**

**26 HRS.**

BIO	114	Principles of Biology I	(4)
BIO	124	Principles of Biology II	(4)
BIO	154	Basic Human Anatomy & Physiology	(4)
BIO	274	General Ecology	(4)
BIO	324	Microbiology	(4)
BIO	343	Cell Biology	(3)
3 Credits of Biology Electives			(3)

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

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**BIOMEDICAL ENGINEERING MINOR**

**26 HRS.**

**REQUIRED BIOMEDICAL COURSES**

**17 HRS.**

BIO	384	Human Anatomy & Physiology I w/Lab	(4)
BIO	394	Human Anatomy & Physiology II w/Lab	(4)
BME	2013	Intro to Biomedical Engineering	(3)
BME	3003	Intro to Biomechanics	(3)
BME	3103	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: 26 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	204	Organic Chemistry I	(4)
BIO	324	Microbiology	(4)
BIO	434	Biochemistry I	(4)

**REQUIRED ENGINEERING COURSES**

**3 HRS.**

CHE	303	ChE Fluid Dynamics	(3)
BME	4603	Biofluid Mechanics	(3)

**CHOOSE TWO OF THE FOLLOWING 3-CREDIT COURSES 6 HRS.**

CHE	4073	Biochemical Engineering	
Or			
BME	4303	Biochemical Engineering	(3)
CHE	4173	Bio-Separations Processes	(3)
BME	4503	Tissue Engineering	(3)

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

(Examples include BME 4503, CHE 4273, BIO 304, BIO 314, BIO 343, BIO 374, BIO 384, or BIO 444)

**TOTAL IN MINOR PROGRAM:**

**24-25 HRS.**

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**BUSINESS MINOR**

**21 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)

**TOTAL IN MINOR PROGRAM:**

**21 HRS.**

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<b>CHEMISTRY MINOR</b>	<b>24 HRS.</b>
(FOR NON-EDUCATION STUDENTS WITH ANOTHER MAJOR)	
CH 104 General Chemistry I	(4)
CH 114 General Chemistry II	(4)
CH 234 Quantitative Chemical Analysis	(4)
Chemistry electives	(12)
<b>TOTAL IN MINOR PROGRAM:</b>	<b>24 HRS.</b>

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<b>COACHING MINOR</b>	<b>15 HRS.</b>
FIT 201X Coaching Internship	(3)
<b>CHOOSE 12 HOURS OF ELECTIVES FROM BELOW COURSES:</b>	
EXS 203 Risk & Sports	(3)
EXS 273 Nutrition	(3)
EXS 333 Kinesiology	(3)
EXS 343 Principles of Human Performance	(3)
EXS 493 Strength & Conditioning Preparation	(3)
LDR 203 Leadership Strengths & Skills	(3)
SM 393 Sport Psychology (or other 200 or above PSY course)	(3)
SM 413 Organization & Administration of Physical Ed & Athletics	(3)
<b>TOTAL IN MINOR PROGRAM:</b>	<b>15 HRS.</b>

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<b>COMMUNICATION MINOR</b>	<b>15 HRS.</b>
(FOR A STUDENT WITH ANOTHER MAJOR)	
COM 163 Interpersonal Communication	(3)
COM prefix courses with at least six hours at the 300-level or above.	(12)
<b>TOTAL IN MINOR PROGRAM:</b>	<b>15 HRS.</b>

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<b>CRIMINAL JUSTICE MINOR</b>	<b>15 HRS.</b>
(FOR A STUDENT WITH ANOTHER MAJOR)	
LE 103 Introduction to Criminal Justice	(3)
LE 153 Juvenile Justice	(3)
LE 253 Probation, Parole & Community Corrections	(3)
LE 263 Introduction to Criminal Law & Justice	(3)
LE 273 Criminal Procedures & Evidence	(3)
<b>TOTAL IN MINOR PROGRAM:</b>	<b>15 HRS.</b>

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<b>DATA SCIENCE MINOR</b>			<b>24 HRS.</b>
(For non-Informatics Majors)			
<b>PROGRAM REQUIREMENT</b>			<b>24 HRS.</b>
CSIT	103	Introduction to Information Systems	
or			
BA	113	Business Applications	(3)
INF	263	Data Management	(3)
INF	403	Advanced Database	(3)
INF	433	Data Mining & Visualization	(3)
MA	203	Discrete Mathematics	(3)
MA	253	Statistics	(3)
MA	323	Operations Research	(3)
PHL	343	Logic	(3)
<b>TOTAL IN MINOR PROGRAM:</b>			<b>24 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 & 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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<b>ENGLISH MINOR</b>	<b>15 HRS.</b>
<b>CHOOSE TWO OF THE FIVE LITERATURE SURVEYS</b>	<b>6 HRS.</b>
ENG 253 Readings in World Literature	
ENG 2013 British Literature I	
ENG 2023 British Literature II	
ENG 2113 American Literature I	
ENG 2123 American Literature II	
<b>CHOOSE 9 CREDITS FROM THE FOLLOWING:</b>	<b>9 HRS.</b>
THE 103 Introduction to Theatre	
FLM 203 Film Appreciation	
ENG 153 Introduction to Literature	
ENG elective 200 level or higher	
<b>TOTAL IN MINOR PROGRAM:</b>	<b>15 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 Ketner School of Business program, the entrepreneurship minor uses collaborative, problem-based learning, assessment of learning outcomes, and collaboration among students, faculty, and business partners to deliver a dynamic program. Courses in the entrepreneurship program will help students develop an “entrepreneurial mindset,” so that they can be innovative thinkers and leaders in a startup company or an existing company.

<b>PROGRAM REQUIREMENTS</b>	<b>24 HRS.</b>
ENT 423 Entrepreneurship & Venture Planning	(3)
FIN 323 Money & Banking	(3)
FIN 363 Venture Finance	(3)
MGT 323 Leadership	(3)
<b>SELECT 12 HOURS FROM THE LIST BELOW:</b>	<b>(12)</b>
AC 423 Personal Income Tax	
FIN 353 Personal Finance	
MGT 313 Human Resource Management	
MGT 333 Supervision	
MGT 443 Managing Operations	
MK 363 Buyer Behavior	
MK 423 Personal Selling	
MK 463 Marketing Research	
MK 473 Digital Advertising (SEM/SEO)	
<b>TOTAL IN MINOR PROGRAM:</b>	<b>24 HRS.</b>

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Trine University

**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	423	Entrepreneurship & Venture Planning	(3)
LAW	203	Business Law I	(3)
MGT	323	Leadership	(3)
MK	203	Marketing	(3)

**SELECT 6 HOURS FROM THE LIST BELOW:**

**(6)**

AC	423	Personal Income Tax
FIN	353	Personal Finance
MGT	313	Human Resource Management
MGT	333	Supervision
MGT	443	Managing Operations
MK	363	Buyer Behavior
MK	423	Personal Selling
MK	463	Marketing Research
MK	473	Digital Advertising (SEM/SEO)

**TOTAL IN MINOR PROGRAM:**

**24 HRS.**

**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	Pollution Control Technologies	(3)
CE	3101	Environmental Engineering Lab	(1)
CE	3103	Environmental Engineering	(3)

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

**ENVIRONMENTAL ENGINEERING DEPTH COURSES 9 HRS.**

CE	4113	Environmental Remediation	
CE	4123	Water & Wastewater Treatment	
CE	4323	Engineering Hydrology	
or			
CE	4333	Water Distribution & Design of Sewers	
or			
CE	4303	Open Channel Hydraulics	
CHE	453	Chemical Engineering Kinetics	
CHE	4073	Biochemical Engineering	
CHE	4083	Plant Management	

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

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**EXERCISE SCIENCE MINOR 15 HRS.**

EXS	483	Professional Development in Exercise Science	(3)
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**CHOOSE 12 CREDITS FROM THE FOLLOWING:**

BIO	154	Basic Human Anatomy & Physiology	(4)
EXS	102	Lifetime Wellness	(2)
EXS	103	Teaching Sport Skills I	(3)
EXS	273	Nutrition	(3)
EXS	283	Fitness Evaluation Assessments	(3)
EXS	333	Kinesiology	(3)
EXS	353	Exercise Physiology	(3)
EXS	373	Health Promotion & Problems	(3)

**TOTAL IN MINOR PROGRAM: 15 HRS.**

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<b>FINANCE MINOR</b>			<b>24 HRS.</b>
FIN	323	Money & Banking	(3)
FIN	353	Personal Finance	(3)
FIN	403	Investments	(3)
FIN	413	Advanced Managerial Finance	(3)
AC or FIN Electives 300 level or above (including Graduate courses)			(6)
AC, BA, ECO, ENT, FIN, MGT, or MK Electives 300 level or above (including Graduate courses)			(6)
<b>TOTAL IN MINOR PROGRAM:</b>			<b>24 HRS.</b>

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<b>FORENSIC PSYCHOLOGY MINOR</b>			<b>15 HRS.</b>
PSY	113	Principles of Psychology	(3)
PSY	383	Forensic Psychology	(3)
PSY	443	Advanced Forensic Psychology	(3)
PSY	323	Abnormal Psychology	(3)
LE	103	Introduction to Criminal Justice	(3)
<b>TOTAL IN MINOR PROGRAM:</b>			<b>15 HRS.</b>

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<b>THOMAS AND JOY LACOUR GOLF MANAGEMENT MINOR</b>			<b>24 HRS.</b>
GM	203	Golf Shop Management	(3)
GM	213	Golf Club Design, Repair & Fitting	(3)
GM	323	Teaching the Golf Swing	(3)
MGT	373	Facility Management	(3)
MGT	383	Principles of Project Management	(3)
MGT	403	Principles of Hospitality Management	(3)
GM, MGT, or MK Electives 300-400 level			(6)
OR			
BA	3113	Golf Internship and GM, MGT or MK Elective 300-400 Level	(6)
<b>TOTAL IN MINOR PROGRAM:</b>			<b>24 HRS.</b>

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**GAMING AND ESPORTS MINOR 15 HRS.**

**CHOOSE ANY 2 OF THE FOLLOWING COURSES (6)**

EXS 223 eSports Analytics (3)

EXS 253 eSports Administration (3)

HIS 283 History of Gaming (3)

**CHOOSE ANY 9 HOURS OF ELECTIVES (9)**

COM 243 Digital Media Creation (3)

CSIT 163 Using Programming Languages to Solve Problems (3)

EXS 223 eSports Analytics (3)

EXS 253 eSports Administration (3)

EXS 273 Nutrition (3)

HIS 283 History of Gaming (3)

MGT 383\* Principles of Project Management (3)

MK 203\* Marketing (3)

SE 221 Introduction to Game Design (1)

SM 393 Sport Psychology (3)

\*Please note that MK 203 and MGT 383 have BA 123 as a prerequisite.

**TOTAL IN MINOR PROGRAM: 15 HRS.**

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**HISTORY MINOR 15 HRS.**

**CHOOSE ANY 2 OF THE FOLLOWING HISTORY COURSES (6)**

HIS 103 American History I

HIS 113 American History II

HIS 203 World Civilization I

HIS 213 World Civilization II

**HISTORY ELECTIVES (9)**

History electives, at least 3 credit hours level 300 or above

**TOTAL IN MINOR PROGRAM: 15 HRS.**

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<b>LEADERSHIP MINOR</b>		<b>24 HRS.</b>
<b>CORE CLASSES</b>		<b>18 HRS.</b>
COM 163	Interpersonal Communication	(3)
LDR 403	Creativity, Innovation, & Influence	(3)
LDR 433	Leadership Practicum	(3)
MGT 323	Leadership	(3)
PHL 313	Ethics	(3)
PSY 113	Principles of Psychology	(3)
<b>LEADERSHIP ELECTIVES</b>		<b>6 HRS.</b>
Choose two courses from the following:		(6)
BA 333	Social Media for Business	
COM 213	Business Communication	
COM 233	Intercultural Communication	
COM 363	Persuasion & Argumentation	
COM 413	Corporate & Organizational Communication	
POLS 343	American Political Thought	
POLS 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 343	Social Psychology	
PSY 373	Political Psychology	
SM 313	Sport & Recreational Management	
SM 393	Sport Psychology	
SM 413	Organization & Administration of Athletics	
<b>TOTAL IN MINOR PROGRAM:</b>		<b>24 HRS.</b>

<b>MANAGEMENT MINOR</b>		<b>24 HRS.</b>
MGT 313	Human Resources Management	(3)
MGT 323	Leadership	(3)
MGT 353	Designing Operations	(3)
MGT 373	Facility Management	(3)
MGT 383	Principles of Project Management	(3)
MGT 413	Management of Quality	(3)
Management electives (MGT)		(6)
<b>TOTAL IN MINOR PROGRAM:</b>		<b>24 HRS.</b>

<b>MARKETING MINOR</b>			<b>24 HRS.</b>
BA	123	Business Concepts	(3)
ECO	213	Microeconomics	(3)
MK	203	Marketing	(3)
MK	323	Integrated Marketing Communications	(3)
MK	423	Personal Selling	(3)
MK	473	Digital Advertising SEM/SEO	(3)
Marketing electives *			(6)
*COM 301, COM 343, COM 353, COM 363, COM 373, COM 383, COM 413, COM 433, COM 453, COM 483, HOS 303, HOS 322, MK 313, MK 343, MK 353, MK 363, MK 433, MK 483, MK 493, MK 503, PSY 333, PSY 343, SM 393			
<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 MAE courses in the minor.

**REQUIRED SCIENCE COURSE 4 HRS.**

CH 104 General Chemistry I  
or

CH 104H Honors General Chemistry I (4)

**REQUIRED ENGINEERING SCIENCE COURSE 3 HRS.**

ES 233 Engineering Materials (3)

**REQUIRED MATHEMATICS COURSE 3 HRS.**

MA 393 Probability & Statistics (3)

**REQUIRED MECHANICAL ENGINEERING COURSES 18 HRS.**

MAE 243 Manufacturing Processes & 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)

**TOTAL IN MINOR PROGRAM 28 HRS**

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**MUSIC MINOR**

**25 HRS.**

MUS 112 Piano Lab (2)

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 Techniques of Conducting (3)

**SELECT APPLIED STUDIES 4 HRS.**

MUS 1011 Applied Studies (1)  
(Woodwind, Brass, Percussion, String, Voice)

**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 Jazz/Show Choir (1)

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

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**PLASTICS ENGINEERING MINOR**

**25 HRS.**

Available to all Engineering and Technology students.

**REQUIRED CORE COURSES**

ETD	353	Thermodynamics & Heat Transfer for Technologists	(3)
PET	223	Polymer Structure, Properties & Applications	(3)
PET	224	Plastics Processing & Testing	(4)
PET	323	Plastics Product Design	(3)
PET	333	Plastics Mold Engineering & 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 & Lean Manufacturing
MGT	413	Management of Quality

**TOTAL IN MINOR PROGRAM:**

**25 HRS.**

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**POLITICAL SCIENCE MINOR**

**15 HRS.**

POLS	113	Introduction to Government	(3)
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**CHOOSE 12 CREDITS FROM THE FOLLOWING COURSES:**

**(12)**

POLS	313	Comparative Governments
POLS/HIS	323	The Contemporary World
POLS	333	State & Local Government
POLS/HIS	343	American Political Thought
POLS/HIS	363	United States Foreign Policy
POLS/PSY	373	Political Psychology
POLS/HIS	403	American Constitutional Development
POLS/HIS	423	U.S. as a World Power

**TOTAL IN MINOR PROGRAM:**

**15 HRS.**

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<b>PSYCHOLOGY MINOR</b>	<b>15 HRS.</b>
<b>REQUIRED CORE COURSES</b>	
PSY 113 Principles of Psychology	(3)
<b>CHOOSE 1 FROM CLINICAL CORE COURSES:</b>	<b>(3)</b>
PSY 323 Abnormal Psychology	
PSY 363 Counseling	
PSY 413 Psychology of Addiction	
PSY 423 Counseling Theories & Practices	
<b>CHOOSE 1 FROM SOCIAL CORE COURES</b>	<b>(3)</b>
PSY 333 Psychology of Personality	
PSY 343 Social Psychology	
PSY 373 Political Psychology	
<b>CHOOSE 1 FROM DEVELOPMENTAL CORE COURES</b>	<b>(3)</b>
PSY 223 Lifespan Development Psychology	
SOC 323 The Family	
PSY 353 Child & Adolescent Psychology	
<b>PSYCHOLOGY ELECTIVES 200 OR ABOVE</b>	<b>(3)</b>
<b>TOTAL IN MINOR PROGRAM:</b>	<b>15 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 200 level and above ECE and MAE courses in the minor.

<b>REQUIRED COMPUTER SCIENCE COURSE</b>	<b>3 HRS.</b>
CS 1113 Introduction to Object-Oriented Programming	(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 112 Prototyping & 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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**SOCIAL INNOVATION MINOR 15 HRS.**

SI/PHL 213	Theories & Philosophies of Social Innovation	(3)
LDR 403	Creativity, Innovation & Influence	(3)
SI 403	Social Innovation Practicum	(3)

**ELECTIVES (3)**

**Select 6 hours of major-or-career related tactical and/or theoretical courses from the below Course Bank. Other courses can be reviewed and approved in collaboration with student's academic advisor.**

BA 123, BA 343, BA 6203, BIO 214/L, BIO 274/L, BIO 284/L, BIO 334, BME 4853, BME 4863, CE 3103, CE 4103, CE 4113, CE 4123, CE 4333, CE 4613, CE 4713, CHE 222, COM 153, COM 213, COM 233, COM 253, COM 453, CRJ 563, ECO 203, ECO 323, ECO 383, EM 253, EM 343, EM 383, EM 423, ES 382, ES 4703, ETD 163, ETD 313, ETD 323, EXS 233, EXS 273, EXS 373, EXS 383, EXS 433, EXS 473, FIN 343/5833, FIN 363, FIN 403, FIN 5203, GEO 303, LDR 343, MGT 303, MGT 323, MGT 363, MGT 373, MGT 383, MGT 443, MK 323, MK 343, MK 353, MK 363, MK 373, MK 423, PET 323, PET 333, PSY/SOC 343, PSY 363, PSY 373, PSY 413, PSY 433, SOC 323

**TOTAL IN MINOR PROGRAM: 15 HRS.**

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**SOFTWARE ENGINEERING MINOR 24 HRS.**

**REQUIRED COMPUTER SCIENCE COURSE 15 HRS.**

CS 1113	Introduction to Object-Oriented Programming	(3)
CS 1123	C++ & Object-Oriented Design	(3)
CS 2103	Algorithm Design and Analysis	(3)
SE 353	Software Engineering	(3)
SE 393	Software Patterns & Team Development	(3)
BA 123	Business Concepts	(3)
CS/SE Electives above 300/3000 level, or CS 2213		6 HRS.

**TOTAL IN MINOR PROGRAM 24 HRS.**

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**SPANISH MINOR 15 HRS.**

Students who plan to enroll in the Spanish Minor must demonstrate a second semester competency in Spanish (SPN 123). Students can enroll in SPN 113 and SPN 123 at Trine. If they seek credit for first year Spanish as a heritage speaker or due to several years of study in high school, students must take either the CLEP exam and pass with a score of 4 or higher or the AP exam and pass with a 3 or higher. A grade of C or higher in all courses counting toward the minor is required.

SPN 203	Spanish III	(3)
SPN 213	Spanish IV	(3)
SPN 303	Spanish Language for Minors	(3)
SPN 313	Spanish Writing & Composition	(3)
SPN 323	Spanish Culture	(3)

**TOTAL IN MINOR PROGRAM: 15 HRS.**

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<b>SPORT PSYCHOLOGY MINOR</b>			<b>15 HRS.</b>
PSY	113	Principles of Psychology	(3)
EXS	103	Teaching of Sport Skills	(3)
SM	393	Sport Psychology	(3)
EXS	343	Principles of Human Performance	(3)
PSY	413	Psychology of Addiction	(3)
<b>TOTAL IN MINOR PROGRAM:</b>			<b>15 HRS.</b>

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**STRUCTURAL ENGINEERING MINOR** **30 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** **18 HRS.**

CE	3201	Civil Engineering Materials Laboratory	(1)
CE	3203	Civil Engineering Materials	(3)
CE	3501	Structural Analysis Lab	(1)
CE	3503	Structural Analysis I	(3)
CE	3521	Structural Design Lab	(1)
CE	3523	Structural Design I	(3)
CE	4503	Structural Analysis II	(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** **30 HRS.**

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## **ALLEN SCHOOL OF ENGINEERING AND COMPUTING**

**Trine University's Allen School of Engineering and Computing 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
- ENGINEERING TECHNOLOGY
  - DEPARTMENT OF DESIGN ENGINEERING TECHNOLOGY
  - DEPARTMENT OF COMPUTER SCIENCE & INFORMATION TECHNOLOGY

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

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  
BACHELOR OF SCIENCE IN SOFTWARE ENGINEERING  
BACHELOR OF SCIENCE WITH A MAJOR IN COMPUTER SCIENCE & INFORMATION TECHNOLOGY

### **MINORS**



## **THE SCHOOL**

The Drs. Jerry and Jorja Allen School of Engineering and Computing was named in honor of Jerry Allen, a 1978 mechanical engineering graduate and member of the University's Board of Trustees, and Jorja Allen, a 1978 business administration graduate and member of the Alumni Board of Governors.

## **MISSION**

The Allen School of Engineering and Computing promotes the application of science and technology by preparing graduates for the practice of engineering and engineering technology at the professional level.

## **VISION**

The Allen School of Engineering and Computing will be nationally recognized for the quality of its graduates.

## **VALUES**

To attain its mission and vision, the Allen School accepts that the School must educate engineers and technologists:

- who have a broad education;
- who see themselves as global citizens;
- who have the potential for leadership in business and public service; and
- who have a strong ethical foundation.

## **GOALS**

The Allen School of Engineering and Computing will:

- provide quality preparation for the practice of engineering and engineering technology at the professional level;
- provide graduates with the opportunities to pursue graduate studies, lifelong learning, and to offer service to their profession; and
- provide technical and educational services to the community.

## **PROGRAMMATIC ACCREDITATION**

Trine University's programs in chemical engineering, civil engineering, computer engineering, electrical engineering and mechanical engineering are accredited by the Engineering Accreditation Commission of ABET, <http://www.abet.org>.

## **PROGRAMS AND DEGREE REQUIREMENTS**

The degree programs are listed and then described in the catalog section for each academic department. All undergraduate degrees require students to fulfill General Education requirements (discussed in detail under "[General Education Requirements](#)"), as well as specific program requirements.

**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 or 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 or Humanities elective	(3)
		Engineering or Science course	(1-4)

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## **BOCK BIOMEDICAL ENGINEERING DEPARTMENT**

### **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 the vision of the Allen School of Engineering.

### **MISSION**

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

### **OBJECTIVES**

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

1. to provide graduates with high quality preparation for the practice of leadership in 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 who are able to supply technical and engineering expertise 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;
- E. identify, formulate, and solve engineering problems;
- F. understand 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 BIOMEDICAL ENGINEERING 132 HRS**

	Mathematics	Science	Hum/SS	Communication	Other
General Education 42 hours	MA 134 MA 164	CH 104 and 114 <i>or</i> CH 155H  PH 224 PH 234	PHL 313 HUM elective (3) SS elective (3) SS elective (3)	ENG 103 ENG 133  SP 203	
Additional Requirement 17 hours	MA 213 MA 233 MA 393	BIO 384/BIO 384L BIO 394/BIO 394L			
Core Requirements 73 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: 4 hours</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</p> <p><b><u>ELECTRICAL/COMPUTER ENGINEERING: 4 hours</u></b>                      ECE 213 Circuit Analysis                      ECE 211 Circuit Analysis Lab</p> <p><b><u>BME CORE: 34 hours</u></b>                      BME 2013 Introduction to Biomedical Engineering                      BME 3003 Musculoskeletal Biomechanics                      BME 3103 Biomaterials                      BME 3202 BME Laboratory Techniques                      BME 3212 BME Research Techniques                      BME 4403 BME Measurement/Instrumentation I                      BME 4413 BME Measurement/Instrumentation II                      BME 4503 Tissue Engineering                      BME 4603 Biofluid Mechanics                      BME 4613 Biological Mass &amp; Energy Transport                      BME 4853 BME Design I                      BME 4863 BME Design II</p> <p>*See the next page for concentration requirements</p>				

	<p><b>BME CONCENTRATION REQUIREMENTS</b></p> <p><b>Choose one (1) of the following three concentration areas</b></p>
	<p><b>RESEARCH ENGINEERING (HEALTH SCIENCES) CONCENTRATION: 15 hours</b></p> <p>CH 204 Organic Chemistry I          BIO 324 Microbiology          Or          CH 214 Organic Chemistry II          BIO 434 Biochemistry I          BME XXX3 Elective – BME 4003 ADV Biomechanics                                            BME 4303/CHE 4073 Biochemical Engineering                                            BME 490X Special Topics in BME</p>
	<p><b>ELECTRICAL ENGINEERING CONCENTRATION: 15 hours</b></p> <p>CS 1113 Introduction to Object Oriented Programming          ECE 263 Digital Systems          ECE 261 Digital Systems Lab          ECE 273 Microcontrollers          ECE 271 Microcontrollers Lab          ECE 323 Electromagnetic Fields          ECE XXX1 or BME XXX1 Elective</p>
	<p><b>MECHANICAL ENGINEERING CONCENTRATION: 15 hours</b></p> <p>EGR 143 Engineering Graphics          ES 243 Solid Mechanics          MAE 242 Manufacturing Process &amp; Equipment          MAE 241 Manufacturing Process &amp; Equipment Lab          MAE 353 Machine Component Design          BME XXX3 Elective – BME 4003 ADV Biomechanics                                            BME 4303/CHE 4073 Biochemical Engineering                                            BME 490X Special Topics in BME</p>

**TOTAL IN DEGREE PROGRAM:**

**132 HRS.**

## **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 coursework. 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 engineering is also an excellent

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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:

- 1) An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
- 2) An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
- 3) An ability to communicate effectively with a wide range of audiences.
- 4) An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgements, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
- 5) An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
- 6) An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgement to draw conclusions.
- 7) An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.
- 8) An ability to recognize hazards associated with chemical, biological, and physical processes and be able to evaluate, minimize, and control these hazards.



## THE CHEMICAL ENGINEERING CURRICULUM

The curriculum requires the completion of 132 hours of coursework. 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. Individuals seeking a Bachelor of Science in Chemical Engineering are required to register for the National Council of Examiners for Engineering & Surveying (NCEES) Fundamentals of Engineering (FE) examination prior to graduation.

### 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 203 (or 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 204 CH 234 CH Elective (8 hrs)			4 - 7 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  <b><u>Engineering Science: 5 hours</u></b>                      ES 233 Engineering Materials                      ES 382 Engineering Economics  <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 &amp; Sustainability                      CHE 252 Statistics &amp; 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 &amp; Control                      CHE 473 Chemical Engineering Design I                      CHE 483 Chemical Engineering Design II                      Chemical Engineering Electives (6) credits</p>				

**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 and Computing and Trine University, will excel in the education of individuals uniquely prepared for the practice of civil engineering at the professional level.

Civil 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 economic makeup of society. Therefore, it is essential that students receive a broad foundation in the areas of mathematics, physical and engineering sciences, analytical and design methods, communication skills, 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

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governments, as well as the Army Corps of Engineers, the Air Force and the Navy. Those who pursue advanced degrees often enter teaching and research careers in universities.

### MISSION

The mission of the 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;

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- 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.

	<b>Civil In-Depth Electives</b>
CE 4103	Pollution Control Technologies
CE 4113	Environmental Remediation
CE 4123	Water and Wastewater Treatment
CE 4303	Open Channel Hydraulics
CE 4323	Engineering Hydrology
CE 4333	Design of Water Distribution Systems & Sewers
CE 4603	Highway Geometric Design
CE 4703	Special Topics in Geotechnical Engineering
CE 4713	Foundation Engineering
CE 4723	Pavement Design

**BACHELOR OF SCIENCE IN CIVIL ENGINEERING**

**132 HRS.**

	Mathematics	Science	HUM/SS	Communication	Other
General Education 44 hours	MA 134 MA 164 MA 213	CH104 CH 114 PH 224	HUM elective (3) HUM elective (3) SS elective (3) SS elective (3)	ENG 103 ENG 133 SP 203	
Additional Requirements 6 hours	MA 233 MA 393				

<b>Program Requirements</b> <b>82 hours</b>	<p><b>General Engineering: 4 hours</b>                  GE 101 Introduction to Engineering                  GE 401 Professional Practice                  EGR 152 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 223 Dynamics</p> <p><b>Civil Engineering: 52 hours</b>                  CE 1023 Engineering Math                  CE 2001 Basic Surveying Laboratory                  CE 2003 Basic Surveying                  CE 3101 Environmental Engineering Laboratory                  CE 3103 Environmental Engineering                  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 I                  CE 3521 Structural Design Laboratory                  CE 3523 Structural Design I                  CE 3603 Transportation Engineering                  CE 3701 Soil Mechanics Laboratory                  CE 3703 Soil Mechanics                  CE 3903 Introduction to Site Development                  CE xxx3 Civil Engineering In-Depth Elective                  CE xxx3 Civil Engineering In-Depth Elective                  CE xxx3 Civil Engineering In-Depth Elective                  CE 4911 Civil &amp; Environmental Engineering Design Workshop                  CE 4912 Civil &amp; Environmental Engineering Design Seminar                  CE 4913 Civil &amp; Environmental Engineering Design</p> <p><b>Other Electives: 12 hours</b>                  XX XX3 Business Elective                  XX XX3 Science Elective                  XX XX3 Professional Development Elective                  XX XX3 Professional Development Elective</p>
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**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 Computer Engineering**
- **Bachelor of Science in Electrical Engineering**
- **Bachelor of Science in Software Engineering**

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

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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:

1. Graduates will exhibit technical excellence and professionalism in their chosen vocations.
2. Graduates will continue to grow professionally, personally, and intellectually.
3. Graduates will communicate clearly and persuasively with their peers, decision makers, and those whom they lead.
4. Graduates will be able to function as integral members of diverse, global, and multi-faceted teams.
5. Graduates will maintain and promote ethical principles and social responsibilities; they will value diversity and incorporate 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 2 hours of general engineering courses, 34 hours of required electrical and computer engineering core courses, 11 hours of computer engineering concentration required courses, 12 hours of ECE-, CS-, or CO-prefixed elective courses, 5 hours of engineering science courses, 9 hours of restricted elective courses, and 6 hours of open electives.

This division of courses is planned to assure that computer engineering students complete lecture and laboratory courses in: circuits, analog electronics, digital electronics, embedded systems, software design or software engineering, an advanced computer engineering elective area, and a capstone design project. The format of laboratories and design projects is such that students will experience working as an individual, working with a same-discipline partner or small team, and finally working as part of a multi-disciplinary team. Degree requirements may be fulfilled with the Trine courses listed below or others at the department's discretion. For curriculum-related details, see the department chair.

**BACHELOR OF SCIENCE IN COMPUTER 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 473				
Program Requirements 79 hours	<p><b><u>Electrical &amp; Computer Engineering Core: 34 hours</u></b>                      CS 1113 Introduction to Object-Oriented Programming                      ECE 112 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 3051 Junior Year Lab                      ECE 4001 Contemporary Issues                      ECE 4002 Project Management                      ECE 4003 Design Project (or cross-disciplinary project with an in-major oral examination)</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>Major Electives: 12 hours</u></b>                      Chosen from CO, CS, ECE, or SE prefixed courses; or MAE 4023</p> <p><b><u>Engineering Science: 5 hours</u></b>                      ES elective or FIN 5203                      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>Restricted Electives: 9 hours</u></b>                      Chosen from approved courses: EGR 143; Calculus-based; 300-level or higher</p> <p><b><u>Open Electives: 6 hours</u></b>                      Chosen from approved courses to bring the total to 132 hours.</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 2 hours of general engineering courses, 34 hours of required electrical and computer engineering core courses, 10 hours of electrical engineering concentration required courses, 13 hours of ECE-, CS-, or CO-prefixed elective courses, 6 hours of completely free electives at the college level, 5 hours of engineering science elective courses, and 9 hours of restricted electives chosen for depth or breadth; courses can be approved by the department, but some courses are pre-approved: technical drawing EGR 143, any courses based directly or indirectly on calculus, and all 300, 400, and 500 level courses.

This division of courses is planned to assure that electrical students complete lecture and laboratory courses in: circuits, analog electronics, digital electronics, signals, integrated systems, an advanced electrical engineering elective area, and a capstone design project. The format of laboratories and design projects is such that students will experience working as an individual, working with a same-discipline partner or small team, and finally working as part of a multi-disciplinary team.

The degree requirements may be fulfilled with the Trine courses listed below or others at the department's discretion. For curriculum-related details, see the department chair.

**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 300-400 level elect (3)				
Program Requirements 79 hours	<p><b><u>Electrical &amp; Computer Engineering Core: 34 hours</u></b>                      CS 1113 Introduction to Object-Oriented Programming                      ECE 112 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 3051 Junior Year Lab                      ECE 4001 Contemporary Issues                      ECE 4002 Project Management                      ECE 4003 Design Project (or cross-disciplinary project with an in-major oral examination)</p> <p><b><u>Electrical Engineering Concentration: 10 hours</u></b>                      ECE 313 Electrical Power                      ECE 323 Dynamic EM Fields                      ECE 481 Instrument Systems Laboratory                      ECE 483 Instrument Systems</p> <p><b><u>Major Electives: 13 hours</u></b>                      Chosen from CO, CS, ECE, or SE prefixed courses; or MAE 4023</p> <p><b><u>Engineering Science: 5 hours</u></b>                      ES elective or FIN 5203                      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>Restricted Electives: 9 hours</u></b>                      Chosen from approved courses: EGR 143, Calculus based; 300-level or higher</p> <p><b><u>Open Electives: 6 hours</u></b>                      Chosen from approved courses to bring the total to 132 hours.</p>				

**TOTAL IN DEGREE PROGRAM:**

**132 HRS.**

## **BACHELOR OF SCIENCE IN SOFTWARE ENGINEERING**

The software engineering degree program requires 128 semester hours of study comprising 44 hours of University general education, 6 additional hours of mathematics and 3 additional hours of mathematics or science beyond the general education requirement and 75 hours of program-specific requirements. The program-specific requirements include 2 hours of general engineering courses, 42 hours of required computer science, electrical and software engineering core courses, 2 hours of engineering science elective courses, 12 hours of COM 343, ECE 361 & 363, CO 453, or any CS- or SE- prefixed elective courses, and 8 hours of open and 9 hours of guided electives. Students are encouraged to use the 17 elective hours to meet the requirements for a minor in an area of their interest.

This division of courses is planned to assure that software students complete lecture and laboratory courses in: circuits, analog electronics, digital electronics, signals, integrated systems, an advanced electrical engineering elective area, and a capstone design project. The format of laboratories and design projects is such that students will experience working as an individual, working with a same-discipline partner or small team, and finally working as part of a multi-disciplinary team.

The degree requirements may be fulfilled with the Trine courses listed below or others at the department's discretion. For curriculum-related details, see the department chair.

**BACHELOR OF SCIENCE IN SOFTWARE ENGINEERING 128 HOURS**

	Mathematics	Science	Hum/SS	Communication	Other
General Education 44 hours	MA 134 MA 164 MA 213	CH 104 OR BIO 114  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 393 MA 473				
Program Requirements 75 hours	<p><b>General Engineering: 2 hours</b> GE 101 Introduction to Engineering GE 401 Professional Practice</p> <p><b>Unrestricted Electives: 8 hours</b> Any college-level courses</p> <p><b>Guided Electives: 9 hours</b> Any 300-level or higher course in the Jannen School of Arts and Sciences or the College of Business or Engineering is pre-approved. 100 or 200 level courses can be approved by the departmental curriculum committee.</p> <p><b>Engineering Science: 2 hours</b> ES 382 Engineering Economics</p> <p><b>Software Engineering Core: 42 hours</b> CS 1113 Introduction to Object-Oriented Programming CS 1123 C++ &amp; Object-Oriented Design CS 2103 Algorithms and Data Structures ECE 261 Digital Systems Laboratory ECE 263 Digital Systems ECE 271 Microcontrollers Laboratory ECE 273 Microcontrollers ECE 371 Embedded Systems Laboratory ECE 373 Embedded Systems ECE 4001 Contemporary Issues for Engineers ECE 4002 Project Management ECE 4003 Design Project SE 153 Client-side Database Development SE 233 Systems Programming SE 353 Software Engineering SE 383 Computer Security SE 393 Software Patterns &amp; Team Development</p> <p><b>Software Engineering Concentration Electives: 12 hours</b> Chosen from COM 343, ECE 361 &amp; 363, CO 453 or any CS or SE prefixed courses</p>				

**TOTAL IN DEGREE PROGRAM:**

**128 HRS.**

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

The Dr. Forrest V. Wade Department of Mechanical and Aerospace 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 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 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 tools and machines of all types, from paper clips to space shuttles. They plan, design, and direct the manufacture, distribution, and operation of these items. Mechanical engineers also design the power sources needed to operate the machines and provide for the environment in which they function. In fact, mechanical engineering involves all phases of energy production and utilization: engines, power plants, electrical generation, heating, ventilating, and air conditioning.

Those mechanical engineers who choose to specialize in the aerospace area are particularly suited for employment in vehicle design. They may be involved in the design of aircraft, spacecraft, missiles, automobiles, trucks, buses, trains, or ships. Their specialized knowledge of lightweight structures and efficient, low drag design take on added importance as fuel costs increase.

Other mechanical engineers may specialize in the area of metallurgy and focus on the relationships among the structure, properties, processing and performance of metals. These engineers will be involved in product design, process development, and equipment design in addition to material specification, failure analysis, and implementing manufacturing processes.

Due to the diverse nature of the profession, the mechanical engineering education must provide a very broad base of studies. To be successful a mechanical engineer must be able to communicate knowledge and ideas to others; thus communication skills are an important part of the engineer's preparation. Studies in the social sciences and humanities develop an understanding of the relevance and impact of engineering and technology on society. Mathematics provides the engineer with the tools needed to build on the scientific foundations of chemistry and physics. The engineering sciences, common to all engineering disciplines,



## Trine University

provide a broad foundation for the design of both thermal and mechanical systems, which are at the core of mechanical engineering.

Engineering creativity cannot be developed by theory alone; an engineer learns by doing. Thus, the laboratory courses stress hands-on work and the project design courses involve real-world problems. Multidisciplinary teams, involving students from business, technology, and/or other engineering programs in the senior design projects prepare students for the team design approach common in industry. A cooperative education program, incorporating alternating periods of full-time work and full-time school, is available to enhance the education and provide valuable engineering experience. Students are encouraged to participate in this optional program.

### **MISSION**

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

### **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	<u>12 hours</u> HUM elective HUM elective SS elective ECO 213	ENG 103 ENG 133 SP 203	
Add'l 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  <b><u>Unrestricted Electives: 6 hours</u></b>                      Electives (6)  <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  <b><u>ME Core 36 hours</u></b>                      MAE 202 Mechanical Engineering Analysis                      MAE 201 Intro to Programming in MATLAB                      MAE 242 Manufacturing Processes &amp; Equipment                      MAE 241 Manufacturing Processes &amp; Equipment Lab                      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                       MAE 453 Mechanical Vibrations  <b>or</b>                      MAE 4023 System Dynamics &amp; Controls                       MAE 463 Measurement Lab                      MAE 4053 Mechanical Design I                      MAE 4063 Mechanical Design II   <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.**

## **ENGINEERING TECHNOLOGY**

The Department of Engineering Technology offers the following degrees:

- **Bachelor of Science in Design Engineering Technology**
- **Bachelor of Science with a major in Computer Science & Information Technology**

Students are prepared for the innovative design work required in this area. The degree prepares students with a foundation in mathematics and science, and understanding of the relevance and impact of engineering and technology on society. This is achieved through a combination of classroom study and hands on laboratory experiences. Professional communication skills are also emphasized.

In addition to academic activities, field experience can be a major factor in acquiring a desired position upon graduation. Cooperative Educational Programs (Co-op) are available to enhance the educational experience and provide necessary industrial experience. Students are encouraged to participate in these optional programs, and the department and Career Services offer help to any student seeking Co-op or summer employment in their major.

### **MISSION**

In concert with the mission of Trine University and the Allen School of Engineering and Computing, the Department of Technology will provide an academic environment with an interactive educational climate which produces high quality graduates that are engaged, well-rounded, and technologically experienced.

### **OBJECTIVES**

1. To produce graduates who are prepared for careers in the areas associated with the analysis, applied design, development, implementation, and oversight of design projects and processes.
2. Foster a desire for personal development to ensure a lifetime of professional advancement, success, and an appreciation for the ethical and social responsibilities of a design engineering technologist.
3. Equip students with sufficient general education studies, including liberal arts, to permit the graduate to communicate effectively and to function as a responsible citizen.

### **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

## Trine University

- 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	ECO 213 ECO 223 HUM elective HUM elective	ENG 103 ENG 133 SP 203	
Add'l 4 hrs.		CH 144			
Core Requirements 75 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 &amp; 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            CSIT 103 Introduction to Information Systems            MGT 353 Designing Operations            MGT 363 Organizational Behavior            MGT 413 Management of Quality</p> <p><b><u>Free Electives: 11 hours</u></b>            Department Approved Elective (3 credit hours)            Department Approved Elective (3 credit hours)            300/400 Department Approved Elective (3 credit hours)            300/400 Department Approved Elective (3 credit hours)</p>				

**TOTAL IN DEGREE PROGRAM:**

**121 HRS.**

## BACHELOR OF SCIENCE WITH A MAJOR IN COMPUTER SCIENCE & INFORMATION TECHNOLOGY

The computer science and information technology program is designed to prepare students for a wide range of endeavors in the information field, including information management, information security, research and information services, and information science.

Graduates of the computer science and information technology program will be qualified for jobs in the information and technology industry and in business, public service, and other various professions. Possible job titles include security and performance analyst, information management specialist, network administrator, product developer, business analyst, usability engineer, database administrator, and many others.

The program also provides strong preparation for graduate studies. Graduates will qualify to be placed in prestigious graduate schools and pursue a variety of programs, including information security, information and management science, information science, information technology, and technical law.

The mission of this program is to provide students with a broadly based and sophisticated understanding of information and its technology, preparing them for careers in this rapidly emerging field.

## BACHELOR OF SCIENCE COMPUTER SCIENCE & INFORMATION TECHNOLOGY MAJOR 120 HRS.

	Mathematics	Science	Hum/SS	Communication	Other
<b>General Education</b> 42 hours	MA 113 MA 173 MA 253	SCI Elect (3)	PSY 113 SS elective (3) PHL 313 Ethics PHL 343 Logic	ENG 103 ENG 133  SP 203	Gen Ed elective (9)
<b>Content Requirements</b> 46 hours	BA 123 Business Concepts CSIT 101 Introduction to Computer Science & Information Technology CSIT 103 Introduction to Information Systems CSIT 123 IT Infrastructure Basics CSIT 153 Introduction to Operating Systems CSIT 163 Using Programming Languages to Solve Problems CSIT 223 Network Management CSIT 253 Artificial Intelligence & Information CSIT 273 Enterprise Architecture INF 263 Data Management INF 343 Network Security INF 403 Advanced Database MA 203 Discrete Mathematics for Information Sciences MA 323 Operations Research MGT 303 Risk Management MGT 383 Principles of Project Management				

<b>Concentration</b> <b>24 hours</b>	<p><b><u>Option A - Cybersecurity</u></b>            CS 1113 Introduction to Object-Oriented Programming            CS 1123 C++ &amp; Object-Oriented Design            CSIT 403 Applications of Cybersecurity            CSIT 443 Advanced Cybersecurity Concepts            LE 273 Criminal Procedure &amp; Evidence            SE 383 Computer Security            CSIT 483 Senior Capstone I            CSIT 493 Senior Capstone II</p> <p><b><u>Option B - Health Information</u></b>            BIO 2X3 Introduction to Health &amp; Disease (PENDING)            INF 383 Principles of Health Informatics            INF 393 Data Visualization            INF 433 Data Mining &amp; Advanced Data Visualization            LDR 403 Creativity, Innovation, &amp; Influence            MGT 363 Organizational Behavior            CSIT 483 Senior Capstone I            CSIT 493 Senior Capstone II</p> <p><b><u>Option C - Web Development</u></b>            COM 343 Web Content Management            CS 1113 Introduction to Object-Oriented Programming            CSIT 203 Website Design            CSIT 233 Designing Data Links to Web Applications            CSIT 243 Mobile Application Development            CSIT 333 Introduction to E-Commerce Sit Development            CSIT 483 Senior Capstone I            CSIT 493 Senior Capstone II</p>
<b>Add'l</b> <b>8 hours</b>	<p><b><u>Directed Electives: 8 hours</u></b>            Any college-level courses, including CSIT 311X Internship Experience (1-3), as advised by the department</p>

**TOTAL IN DEGREE PROGRAM:**

**120 HRS.**



## **KETNER SCHOOL OF BUSINESS**

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

### **UNDERGRADUATE DEGREE PROGRAMS**

#### **ASSOCIATE DEGREES**

- ACCOUNTING
- BUSINESS ADMINISTRATION

#### **BACHELOR OF SCIENCE IN BUSINESS ADMINISTRATION MAJORS (BSBA)**

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

#### **MINORS**

## THE SCHOOL

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

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

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

## MISSION

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

## COURSES OF STUDY

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

## DEGREE REQUIREMENTS

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

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

1. A liberal arts and sciences curriculum which serves to enrich the academic program so that it constitutes a basic cultural education. Courses in written and oral communication, humanities, social sciences, natural sciences, and mathematics provide basic tools needed for applying knowledge in business administration toward worthwhile goals. The foundation of this curriculum is the [general education requirements](#).
2. A business curriculum that provides the fundamentals through which the entire business enterprise operates.
3. A business specialty curriculum that supplements the business curriculum and allows students to develop a deeper understanding in a specialized area.
4. Business electives that provide for program flexibility and allow students to complement the required credits.

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

### **DOUBLE MAJORS**

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

### **INTERNSHIPS**

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

- The intern gains by actual work experience in a real-world capacity, thus clearly establishing true expectations of the job and profession;
- The company gains by being exposed early to potential employees and by having a chance to evaluate them; and
- The University gains by brokering potential employees and employers and assisting the community.

A maximum of six semester credit hours can be earned toward degree requirements with a maximum of three hours in any one work session. (Golf Management internships are taken for three semester hours.) Internships can take place during any semester but are especially encouraged during the summer. Advisor approval is required.

### **PROGRAM OBJECTIVES (FOR ALL KSB MAJORS)**

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

**MASTER'S OF BUSINESS ADMINISTRATION (MBA) PREPARATION FOR NON-BUSINESS MAJORS**

Students who would like to enter an MBA program after graduation should consider taking the following 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	203	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 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.

### ASSOCIATE IN ACCOUNTING

**60 HRS.**

	Mathematics	Science	Hum/SS	Communication	Other
General Education 22 hours	MA 113  Math or	Science Elect (3)  Science (1)	ECO 213 OR ECO 223 HUM Elect (3)	ENG 103 ENG 113	SP 203
Additional Requirements 8 hours	UE 101 University Experience (Main Campus students) Or BA 102 University Experience Or UE 111 Online Learning Orientation (CGPS students)  BA 201 Professional Development & Strategies  <i>Select two of the following courses (6 hrs.)</i> BA 113 Business Applications COM 213 Business Communication PSY 113 Psychology				
Program Requirements 30 hours	<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 IN ACCOUNTING

**60 HRS.**

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

	Mathematics	Science	Hum/SS	Communication	Other
<b>General Education</b> 22 hours	MA 113  Math or	Science Elect (3)  Science (1)	ECO 213 OR ECO 223 HUM Elect (3)	ENG 103 ENG 113	SP 203
<b>Additional Requirements</b> 8 hours	BA 102/UE 101 University Experience (Main Campus students) Or UE 111 Adult Learning Orientation (CGPS students)  BA 201 Professional Development & Strategies  <i>Select two of the following courses (6 hrs.)</i> BA 113 Business Applications COM 213 Business Communication PSY 113 Psychology				
<b>Program Requirements</b> 30 hours	<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, ECO, ENT, FIN, LAW, LDR, MGT, MK)				

**ASSOCIATE IN BUSINESS ADMINISTRATION**

**60 HRS.**

## **KETNER SCHOOL OF BUSINESS BACHELOR DEGREES**

### **BACHELOR OF SCIENCE IN BUSINESS ADMINISTRATION (BSBA)**

#### **ACCOUNTING MAJOR**

**120 HRS.**

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

#### **UNIFORM CERTIFIED PUBLIC ACCOUNTING EXAMINATION CANDIDATES**

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

**BACHELOR OF SCIENCE IN BUSINESS ADMINISTRATION (BSBA)**

**ACCOUNTING MAJOR**

**120 HRS.**

	Mathematics	Science	Hum/SS	Communication	Other
General Education 42 hours	MA 113 MA 173 MA 253	Science Elect (3)	ECO 213 ECO 223 OR ECO 203 SOC SCI Elect (3)  HUM Elect (3) HUM Elect (3)	ENG 103  ENG 113 OR COM 213  SP 203	PSY 113 BA 213 Gen Ed Elect (3)
Program Requirements 78 hours	<p><b><u>Business Core (35-36 hrs.)</u></b>                      AC 203 Accounting I                      AC 213 Accounting II                      BA 102 University Experience – OR – UE 101 University Experience                      BA 123 Business Concepts                      BA 201 Professional Development and Strategies                      BA 343 International Business                      BA 3113 Business Internship (Advisor will determine the appropriate class)                      FIN 303 Managerial Finance                      LAW 203 Business Law I                      MGT 353 Designing Operations                      MGT 363 Organizational Behavior                      MGT 453 Strategic Management                      MK 203 Marketing</p> <p><b><u>Concentration Requirements (30 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 Personal Income Tax                      AC 463 Auditing                      FIN 413 Advanced Managerial Finance                      Business Electives - 6 hrs. (300-400 level from AC or FIN)</p> <p>Free Electives (12-13 hrs)</p>				

**TOTAL IN DEGREE PROGRAM:**

**120 HRS.**



**BACHELOR OF SCIENCE IN BUSINESS ADMINISTRATION (BSBA)  
APPLIED MANAGEMENT**

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

**TECHNICAL SPECIALTY**

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

**BACHELOR OF SCIENCE IN BUSINESS ADMINISTRATION (BSBA)**

**APPLIED MANAGEMENT MAJOR**

**120 HRS.**

	Mathematics	Science	Hum/SS	Communication	Other
<b>General Education 42 hours</b>	MA 113 MA 173 MA 253	Science Elect (3)	ECO 213 ECO 223 OR ECO 203 SOC SCI Elect (3)  HUM Elect (3) HUM Elect (3)	ENG 103  ENG 113 OR COM 213  SP 203	BA 213 PSY 113 Gen Ed Elect (3)
<b>Program Requirements 78 Hours</b>	<p><b><u>Business Core (35-36 hrs.)</u></b>                      AC 203 Accounting I                      AC 213 Accounting II                      BA 102 University Experience – OR – UE 101 University Experience                      BA 123 Business Concepts                      BA 201 Professional Development &amp; Strategies                      BA 343 International Business                      BA 3113 Business Internship (Advisor will determine the appropriate class)                      FIN 303 Managerial Finance                      LAW 203 Business Law I                      MGT 353 Designing Operations                      MGT 363 Organizational Behavior                      MGT 453 Strategic Management                      MK 203 Marketing</p> <p><b><u>Concentration Requirements (30 hrs)</u></b>                      Business courses with approval of Advisor or Chair – Student must be transferring in all 27 hours of a technical field/concentration. If a student can't transfer in all 27 hours, it must be a field that can be completed at Trine such as Criminal Justice. If the student does not have 27 hours and it can't be completed at Trine, the transfer credits can't be accepted as an applied management concentration. They should be considered as a normal transfer evaluation.</p> <p>Business Elective/Technical Specialty Credit (3 hrs): AC, ENT, FIN, HR, LAW, LDR, MGT, MK</p> <p>Free Electives (12-13 hrs)</p>				

**TOTAL IN DEGREE PROGRAM:**

**120 HRS.**

**BACHELOR OF SCIENCE IN BUSINESS ADMINISTRATION (BSBA)**

**BUSINESS ADMINISTRATION**

**120 HRS.**

	Mathematics	Science	Hum/SS	Communication	Other
General Education 42 hours	MA 113 MA 173 MA 253	Science Elect (3)	ECO 213 ECO 223 OR ECO203 SOC SCI Elect (3)  HUM Elect (3) HUM Elect (3)	ENG 103  ENG 113 OR COM 213  SP 203	BA 213 PSY 113 Gen Ed Elect (3)
Program Requirements 78 hours	<p><b><u>Business Core (35-36 hrs.)</u></b>                      AC 203 Accounting I                      AC 213 Accounting II                      BA 102 University Experience – OR – UE 101 University Experience                      BA 123 Business Concepts                      BA 201 Professional Development &amp; Strategies                      BA 343 International Business                      BA 3113 Business Internship (Advisor will determine the appropriate class)                      FIN 303 Managerial Finance                      LAW 203 Business Law I                      MGT 353 Designing Operations                      MGT 363 Organizational Behavior                      MGT 453 Strategic Management                      MK 203 Marketing</p> <p><b><u>Concentration Requirements (30 hrs.)</u></b>                      AC 303 Cost Accounting                      AC 373 Accounting Information Systems                      FIN 353 Personal Finance                      FIN 413 Advanced Managerial Finance                      MGT 303 Risk Management                      MGT 313 Human Resource Management                      MGT 323 Leadership                      MK 323 Integrated Marketing Communications                      MK 473 Digital Advertising                      Business elective – 3 hrs. (300 - 400 level from AC, BA, ECO, ENT, FIN, HR, LAW, LDR, MGT, MK)</p> <p>Free Electives (12 – 13 hrs)</p>				

**TOTAL IN DEGREE PROGRAM:**

**120 HRS.**

**BACHELOR OF SCIENCE IN BUSINESS ADMINISTRATION (BSBA)  
FINANCE MAJOR**

**120 HRS.**

	Mathematics	Science	Hum/SS	Communication	Other
<b>General Education</b> 42 hours	MA 113 MA 173 MA 253	Science Elect (3)	ECO 213 ECO 223  HUM Elect (3) HUM Elect (3)	ENG 103  ENG 113 OR COM 213  SP 203	BA 213 PSY 113 Gen Ed Elect (3)
<b>Program Requirements</b> 78 hours	<p><b><u>Business Core (35-36 hrs.)</u></b>                      AC 203 Accounting I                      AC 213 Accounting II                      BA 102 University Experience – OR – UE 101 University Experience                      BA 123 Business Concepts                      BA 201 Professional Development &amp; Strategies                      BA 343 International Business                      BA 3113 Business Internship (Advisor will determine the appropriate class)                      FIN 303 Managerial Finance                      LAW 203 Business Law I                      MGT 353 Designing Operations                      MGT 363 Organizational Behavior                      MGT 453 Strategic Management                      MK 203 Marketing</p> <p><b><u>Concentration Requirements (30 hrs.)</u></b>                      AC 303 Cost Accounting                      AC 423 Personal Income Tax                      FIN 323 Money &amp; Banking                      FIN 343 International Finance                      FIN 403 Investments                      FIN 413 Advanced Managerial Finance                      FIN 473 Financial Modeling                      Accounting or Finance Electives – 6 hrs. (300 level or above, including Graduate courses)                      Business Elective - 3 hrs. (300 level or above, including Graduate courses)</p> <p>Free Electives (12-13 hrs)</p>				

**TOTAL IN DEGREE PROGRAM:**

**120 HRS.**

**BACHELOR OF SCIENCE IN BUSINESS ADMINISTRATION (BSBA)**

**GOLF MANAGEMENT MAJOR**

**120 HRS.**

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

	Mathematics	Science	Hum/SS	Communication	Other
General Education 42 hours	MA 113 MA 173 MA 253	Science Elect (3)	ECO 213 ECO 223 OR ECO203 SOC SCI Elect (3)  HUM Elect (3) HUM Elect (3)	ENG 103  ENG 113 OR COM 213  SP 203	BA 213 PSY 113 Gen Ed Elect (3)
Program Requirements 78 hours	<p><b><u>Business Core (35-36 hrs.)</u></b>                      AC 203 Accounting I                      AC 213 Accounting II                      BA 102 University Experience – OR – UE 101 University Experience                      BA 123 Business Concepts                      BA 201 Professional Development &amp; Strategies                      BA 343 International Business                      BA 3113 Business Internship (Advisor will determine the appropriate class)                      FIN 303 Managerial Finance                      LAW 203 Business Law I                      MGT 353 Designing Operations                      MGT 363 Organizational Behavior                      MGT 453 Strategic Management                      MK 203 Marketing</p> <p><b><u>Concentration Requirements (30 hrs.)</u></b>                      GM 131 Player Development I                      GM 203 Golf Shop Management                      GM 213 Golf Club Design, Repair &amp; Fitting                      GM 323 Teaching the Golf Swing                      GM 462 Senior Seminar in Golf Management                      MGT 303 Risk Management                      MGT 323 Leadership                      MGT 373 Facility Management                      MGT 383 Principles of Project Management                      MGT 403 Principles of Hospitality Management                      Marketing Elective – 3 hrs. (300 – 400 level MK Elective)</p> <p>Free Electives (12 – 13 hrs)</p>				

**TOTAL IN DEGREE PROGRAM:**

**120 HRS.**

**BACHELOR OF SCIENCE IN BUSINESS ADMINISTRATION (BSBA)  
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 MA 253	Science Elect (3)	ECO 213 ECO 223 OR ECO 203 SOC SCI Elect (3)  HUM Elect (3) HUM Elect (3)	ENG 103  ENG 113 OR COM 213  SP 203	BA 213 PSY 113 Gen Ed Elect (3)
Program Requirements 78 hours	<p><b><u>Business Core (35-36 hrs.)</u></b>                      AC 203 Accounting I                      AC 213 Accounting II                      BA 102 University Experience – OR – UE 101 University Experience                      BA 123 Business Concepts                      BA 201 Professional Development &amp; Strategies                      BA 343 International Business                      BA 3113 Business Internship (Advisor will determine the appropriate class)                      FIN 303 Managerial Finance                      LAW 203 Business Law I                      MGT 353 Designing Operations                      MGT 363 Organizational Behavior                      MGT 453 Strategic Management                      MK 203 Marketing</p> <p><b><u>Concentration Requirements (30 hrs.)</u></b>                      MGT 303 Risk Management                      MGT 313 Human Resource Management                      MGT 323 Leadership                      MGT 373 Facility Management                      MGT 383 Principles of Project Management                      MGT 413 Management of Quality                      Management Elective – 6 hr. (any 300 – 400 Level MGT Electives)                      Marketing Elective – 3 hr. (any 300 – 400 Level MK Elective)                      Business Elective – 3 hrs. (any 300 – 400 level from AC, BA, ECO, ENT, FIN, HR, LAW, LDR, MGT, MK)</p> <p>Free Electives (12 – 13 hrs)</p>				

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

**BACHELOR OF SCIENCE IN BUSINESS ADMINISTRATION (BSBA)**

**MARKETING MAJOR**

**120 HRS.**

Marketing involves creating and satisfying the demands of consumers. It is the study of the organizations and systems involved in the rendering of personal services to the consumer and the physical distribution of goods from the producer to the consumer. The marketing major will discover career opportunities in the fields of sales management, advertising, market research, retailing, brand/product management, merchandising, and marketing management.

	Mathematics	Science	Hum/SS	Communication	Other
<b>General Education</b> 42 hours	MA 113 MA 173 MA 253	Science Elect (3)	ECO 213 ECO 223 OR ECO 203 SOC SCI Elect (3)  HUM Elect (3) HUM Elect (3)	ENG 103  ENG 113 OR COM 213  SP 203	BA 213 PSY 113 Gen Ed Elect (3)
<b>Program Requirements</b> 78 hours	<p><b><u>Business Core (35-36 hrs.)</u></b>                      AC 203 Accounting I                      AC 213 Accounting II                      BA 102 University Experience – OR – UE 101 University Experience                      BA 123 Business Concepts                      BA 201 Professional Development &amp; Strategies                      BA 343 International Business                      BA 3113 Business Internship (Advisor will determine the appropriate class)                      FIN 303 Managerial Finance                      LAW 203 Business Law I                      MGT 353 Designing Operations                      MGT 363 Organizational Behavior                      MGT 453 Strategic Management                      MK 203 Marketing</p> <p><b><u>Concentration Requirements (30 hrs.)</u></b>                      MGT 323 Leadership                      MK 323 Integrated Marketing Communications                      MK 363 Buyer Behavior                      MK 423 Personal Selling                      MK 463 Marketing Research                      MK 473 Digital Advertising SEM/SEO                      Select any two - 6 hrs. (COM 301, COM 343, COM 353, COM 363, COM 373, COM 383, COM 413, COM 433, COM 453, COM 483, HOS 303, HOS 322, MK 313, MK 343, MK 353, MK 433, MK 483, MK 493, MK 503, PSY 333, PSY 343, SM 393)                      Business Electives – 6 hrs. (any 300 - 400 level from AC, BA, ECO, ENT, FIN, HR, LAW, LDR, MGT, MK)</p> <p>Free Electives (12-13 hrs)</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 demand in collegiate and professional sports for business professionals who possess an extensive knowledge of sport and an understanding of the concerns and needs of athletes. Graduates of this program will work with personnel and marketing professionals to promote, regulate, and administer collegiate and professional sport programs.

	Mathematics	Science	Hum/SS	Communication	Other
<b>General Education 42 hours</b>	MA 113 MA 173 MA 253	Science Elect (3)	ECO 213 ECO 223 OR ECO 203 SOC SCI Elect (3)  HUM Elect (3) HUM Elect (3)	ENG 103  ENG 113 OR COM 213  SP 203	BA 213 PSY 113 Gen Ed Elect (3)
<b>Program Requirements 78 hours</b>	<p><b><u>Business Core (35-36 hrs.)</u></b>                      AC 203 Accounting I                      AC 213 Accounting II                      BA 102 University Experience – OR – UE 101 University Experience                      BA 123 Business Concepts                      BA 201 Professional Development &amp; Strategies                      BA 343 International Business                      BA 3113 Business Internship (Advisor will determine the appropriate class)                      FIN 303 Managerial Finance                      LAW 203 Business Law I                      MGT 353 Designing Operations                      MGT 363 Organizational Behavior                      MGT 453 Strategic Management                      MK 203 Marketing</p> <p><b><u>Concentration Requirements (30 hrs.)</u></b>                      MGT 303 Risk Management                      MGT 323 Leadership                      MGT 373 Facility Management                      MGT 383 Principles of Project Management                      MGT 403 Principles of Hospitality Management                      SM 133 Contemporary Issues &amp; Sports                      SM 223 History of Sport                      SM 313 Principle of Sport &amp; Recreation Management                      SM 423 Capstone Experience in Sport Management                      Marketing Elective – 3 hr. (any 300 – 400 Level MK Elective)</p> <p>Free Electives (12 – 13 hrs)</p>				

**TOTAL IN DEGREE PROGRAM:**

**120 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:

- EDUCATION STUDIES
- ELEMENTARY EDUCATION
- ELEMENTARY/SPECIAL EDUCATION MILD INTERVENTION DUAL LICENSURE
- ENGLISH/LANGUAGE ARTS 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 Effectiveness and Licensing. Students are responsible for meeting any requirements for licensure that are in effect at the time they seek to be licensed. The requirements may differ from what is presented in this document. Students should remain alert to changes in requirements. Updated information is available from the Franks School of Education.*

### **THE SCHOOL**

The Franks School of Education was named in honor of Lawrence A. Franks, a 1959 mechanical engineering graduate and an emeritus member of the University's Board of Trustees.

Established in 1884 by a group of Angola citizens, the University began as part of the normal school movement that spread throughout much of the United States during the last half of the nineteenth century. The initial course of study at Tri-State Normal College included teacher education and commerce. In 1921, Frances Kain Shevenaugh earned her "teaching certificate" at Tri-State by completing a twelve-week course of study. In June, 2001, the University reorganized its basic structure to make education a visible component. To renew the tradition of serving the needs of public education in the service area and beyond, the School of Education was created.

### **ACCREDITATION**

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

### **MISSION OF THE SCHOOL**

The mission of the Franks School of Education at Trine University is to provide a supportive and challenging educational environment where teacher candidates embody the professional knowledge, skills, and dispositions required to positively impact the academic and social growth of all learners.

## PROFESSIONAL COMMITMENTS AND DISPOSITIONS

The Franks School of Education has adopted the principles developed by the Council of Chief State School Officers (CCSSO) and the Interstate Teacher Candidate Assessment and Support Consortium (InTASC) as program performance learning outcomes (PO). This set of model core teaching standards outlines what teachers should know and be able to do to ensure every P-12 student succeeds.

1. **Learner Development.** The teacher candidate understands how learners grow and develop, recognizing that patterns of learning and development vary individually within and across the cognitive, linguistic, social, emotional, and physical areas, and designs and implements developmentally appropriate and challenging learning experiences.
2. **Learning Differences.** The teacher candidate uses understanding of individual differences and diverse cultures and communities to ensure inclusive learning environments that enable each learner to meet high standards.
3. **Learning Environments.** The teacher candidate works with others to create environments that support individual and collaborative learning, and that encourage positive social interaction, active engagement in learning, and self-motivation.
4. **Content Knowledge.** The teacher candidate understands the central concepts, tools of inquiry, and structures of discipline(s) he or she teaches and creates learning experiences that make the discipline accessible and meaningful for learners to assure mastery of the content.
5. **Application of Content.** The teacher candidate understands how to connect concepts and use differing perspectives to engage learners in critical thinking, creativity, and collaborative problem solving related to authentic local and global issues.
6. **Assessment.** The teacher candidate understands and uses multiple methods of assessment to engage learners in their own growth, to monitor learner progress, and to guide the teacher's and learner's decision making.
7. **Planning for Instruction.** The teacher candidate plans instruction that supports every student in meeting rigorous learning goals by drawing upon knowledge of content areas, curriculum, cross-disciplinary skills, and pedagogy, as well as knowledge of learners and the community context.
8. **Instructional Strategies.** The teacher candidate understands and uses a variety of instructional strategies to encourage learners to develop deep understanding of content areas and their connections, and to build skill to apply knowledge in meaningful ways.
9. **Professional Learning and Ethical Practice.** The teacher candidate engages in ongoing professional learning and uses evidence to continually evaluate his/her practice, particularly the effects of his/her choices and actions on others (learners, families, other professionals, and the community), and adapts practice to meet the needs of each learner.
10. **Leadership and Collaboration.** The teacher candidate seeks appropriate leadership roles and opportunities to take responsibility for student learning and development, to collaborate with learners, families, colleagues, other school professionals, and community members to ensure learner growth, and to advance the profession.

## Trine University

### **ADMISSION TO PROFESSIONAL EDUCATION SEQUENCE**

Before taking the majority of EDU courses, which begins EDU 301/303, teacher candidates must be officially admitted to the professional education sequence. To apply for the professional education sequence, teacher candidates must demonstrate basic skills competency by earning Indiana passing scores on the reading, mathematics, and writing sections of Praxis 1 (CORE) assessment or qualifying ACT/SAT scores, earn a 3.0 accumulative Trine GPA through at least 24 credit hours, complete an application form and clean criminal background check, and submit a positive letter of recommendation from academic advisor. Transfer students must meet similar requirements. The Franks School of Education should be contacted for further details (260.665.4121).

### **APPROVED PROGRAMS**

All teacher preparation programs are approved by the Indiana Department of Education/Office of Educator Effectiveness and Licensing.

#### **Approved programs include the following:**

*Elementary Education (K-6)*

*Elementary Education/Special Education Mild Intervention Dual Licensure (K-6)*

*Health/Physical Education (P-12)*

*English/Language Arts Education (5-12)*

*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 one content area from economics, government and citizenship, historical perspectives, and/or psychology.

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

### **REMAINING IN PROFESSIONAL EDUCATION SEQUENCE**

Once officially admitted, retention in the professional education sequence is contingent upon good academic standing and successful passing of Benchmark requirements. The GPA required for admission is 3.0 overall.

### **TESTING REQUIREMENTS**

To be eligible for admission to the professional education sequence, State of Indiana passing scores on Praxis 1 (CORE) assessment or qualifying ACT/SAT scores must be submitted. To be eligible for Indiana teaching licensure, State of Indiana passing score(s) on required content area assessment and developmental (pedagogy) area assessment must be submitted. The Franks School of Education should always be consulted before a test is taken to ensure most recent testing requirements are met.

## Trine University

### **STUDENT TEACHING**

Student teaching is completed in an area school, generally within 40 miles of the University, as assigned by the placement coordinator for the Franks School of Education. The student teacher participates in a classroom with a cooperating teacher for 16 full weeks. To be eligible for licensure, the teacher candidate must have earned an overall GPA of 3.0 or higher, a GPA of 3.0 or higher in all areas of licensure, must have successfully completed student teaching with a GPA of 3.0 or higher, and must have met all Benchmark requirements at established levels.

### **LICENSING ADVISOR**

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

**BACHELOR OF SCIENCE EDUCATION STUDIES (Non-Licensure) 120 HRS.**

	Mathematics	Science	Hum/SS	Communication	Other												
General Education 42 hours	MA 113 or MA 133  Math or Science Elect (3)	Science (3)	ENG 153 HUM Elect (3) SOC SCI Elect (3) SOC SCI Elect (3)	ENG 103 ENG 113 SP 203	PSY 113 Gen Elective (9)												
Other 1 hour	UE 101																
Education Content Requirements 20 hours	<p>Must complete at least 20 credit hours from the following EDU courses:</p> <table border="0"> <tr> <td>EDU 111 Freshman Practicum</td> <td>EDU 252 School &amp; Community Health</td> </tr> <tr> <td>EDU 211 Sophomore Practicum*</td> <td>EDU 322 Culturally Responsive Classroom</td> </tr> <tr> <td>EDU 212 Music Fundamentals</td> <td>EDU 362 Classroom Behavior &amp; Environment</td> </tr> <tr> <td>EDU 222 Educational Psychology (K-6)</td> <td>EDU 462 Educational Measurements</td> </tr> <tr> <td>EDU 232 Educational Psychology (5-12)</td> <td>EDU 463 Educational Media Technology</td> </tr> <tr> <td>EDU 242 Physical Education for K-6</td> <td>EDU 473 Issues in American Public Education</td> </tr> </table> <p>*with dean approval Course substitutions must be approved by the dean</p>					EDU 111 Freshman Practicum	EDU 252 School & Community Health	EDU 211 Sophomore Practicum*	EDU 322 Culturally Responsive Classroom	EDU 212 Music Fundamentals	EDU 362 Classroom Behavior & Environment	EDU 222 Educational Psychology (K-6)	EDU 462 Educational Measurements	EDU 232 Educational Psychology (5-12)	EDU 463 Educational Media Technology	EDU 242 Physical Education for K-6	EDU 473 Issues in American Public Education
EDU 111 Freshman Practicum	EDU 252 School & Community Health																
EDU 211 Sophomore Practicum*	EDU 322 Culturally Responsive Classroom																
EDU 212 Music Fundamentals	EDU 362 Classroom Behavior & Environment																
EDU 222 Educational Psychology (K-6)	EDU 462 Educational Measurements																
EDU 232 Educational Psychology (5-12)	EDU 463 Educational Media Technology																
EDU 242 Physical Education for K-6	EDU 473 Issues in American Public Education																
Concentration Requirements 15 hours (x 2)	<p>Must complete at least 15 credit hours listed as options from <b>two</b> of the following minors:</p> <p>Option A - Coaching</p> <p>Option B - Communication</p> <p>Option C - Exercise Science</p> <p>Option D - Leadership</p> <p>Option E - Music</p> <p>Option F - Psychology</p> <p>If approved by academic advisor, student can choose an option not listed to fulfill concentration hour requirement.</p>																
Capstone 3 hours	<p>EDU 4003 Internship</p> <p>Internship will be arranged by the FSOE and based on student career objectives</p>																
Electives 24 hours	24 Elective hours determined in conjunction with advisor and based on student career objectives																

**TOTAL IN DEGREE PROGRAM:**

**120 HRS.**

**BACHELOR OF SCIENCE**

**ELEMENTARY EDUCATION (K-6)**

**120 HRS.**

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

	Mathematics	Science	Hum/SS	Communication	Other
<b>General Education</b> 42 hours	MA 184 MA 194	BIO 1003	ENG 153 ART 253 PSY 113 HIS 103	ENG 103 ENG 113  SP 203 <i>or</i> COM 163	EXS 102 POLS 113 HIS 113 EDU 242
<b>Additional Requirements</b> 21 hours		PH 104	MUS 272  ECO 213 <i>or</i> ECO 223  SOC 323 GEO 303 GEO 323		EDU 252 UE 101
<b>Content Requirements</b> 57 hours	EDU 111 Freshman Practicum EDU 211 Sophomore Practicum EDU 212 Introduction to Music Fundamentals EDU 222 Educational Psychology for Elementary Teachers EDU 301 Instruction Design Practicum EDU 303 Instruction Design EDU 312 Exceptional Children in Schools EDU 322 Culturally Responsive Teaching EDU 353 Children’s Literature EDU 362 Classroom Behavior & Environment EDU 372 Teaching of Literacy (3-6) EDU 441 Teaching of Reading Practicum EDU 445 Teaching of Literacy (K-2) EDU 452 Art for the Elementary Teacher EDU 454 Methods of Math/Science EDU 462 Educational Measurement EDU 463 Educational Media & Technology EDU 464 Methods of Language Arts/Social Studies EDU 470 Student Teaching EDU 473 Issues in American Public Education EDU 482 Student Teaching Seminar				

**TOTAL IN DEGREE PROGRAM:**

**120 HRS.**

**BACHELOR OF SCIENCE DUAL LICENSURE ELEMENTARY EDUCATION (K-6)/SPECIAL EDUCATION MILD INTERVENTION (K-6) 128 HRS.**

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

	Mathematics	Science	Hum/SS	Communication	Other
General Education 43 hours	MA 184 MA 194	BIO 1003	ENG 153 ART 253 PSY 113 HIS 103 SOC 323	ENG 103 ENG 113  SP 203 <i>or</i> COM 163	EXS 102 POLS 113 HIS 113
Additional Requirements 18 hours		PH 104	MUS 272  ECO 213 <i>or</i> ECO 223  GEO 303 GEO 323		EDU 252 UE 101
Content Requirements K-6 55 hours	EDU 111 Freshman Practicum EDU 211 Sophomore Practicum EDU 212 Intro to Music Fundamentals EDU 222 Educational Psychology for Elementary Teachers EDU 242 PE for the Elementary Teacher EDU 301 Instructional Design Practicum EDU 303 Instructional Design EDU 322 Culturally Responsive Teaching EDU 353 Children’s Literature EDU 372 Teaching of Literacy (3-6) EDU 441 Teaching of Reading Practicum EDU 445 Teaching of Literacy (K-2) EDU 452 Art for the Elementary Teacher EDU 454 Methods of Math/Science EDU 462 Educational Measurement EDU 463 Educational Media & Technology EDU 464 Methods of Language Arts/Social Studies EDU 470 Student Teaching EDU 473 Issues in American Public Education EDU 482 Student Teaching Seminar				
Special Education Mild Intervention K-6 12 hours	EDU 181 Foundations of SPED EDU 282 Developmental Needs SPED EDU 382 Behavioral Analysis SPED EDU 483 Individual Planning & Assessment SPED EDU 484 Methods of Teaching SPED				

**TOTAL IN DEGREE PROGRAM:**

**128 HRS.**

**BACHELOR OF SCIENCE**

**ENGLISH/LANGUAGE ARTS EDUCATION (5-12)**

**120 HRS.**

To be eligible for licensure as an English/Language Arts teacher in grades 5-12, the following program of study must be completed.

	Mathematics	Science	Hum/SS	Communication	Other
General Education 42 hours	MA 113 <i>or</i> higher  Math or Science Elect (3)	Science (3)	ENG 153 PSY 113 FLM 203 EDU 473	ENG 103 ENG 113 COM 163 SP 203	ENG 233 ENG 273 ENG 433
Other 2 hours	1 Hour Free Elective Electives are determined in conjunction with an advisor and based on student career objects				UE 101
English/Language Arts Content Area Courses 34 hours	<p><b>English Language - 3 hours</b> ENG 363 The English Language</p> <p><b>Writing &amp; Composition - 13 hours</b> ENG 133 Technical Communication ENG 303 Advanced Technical Communication <i>or</i> ENG 453 Advanced Composition ENG 412 Writing Center Consulting ENG 411 Writing Center Consulting Lab (taken twice) COM 183 Writing for Media</p> <p><b>Literature Surveys - 9 hours (take 3 of 5)</b> ENG 2013 British Literature I ENG 2023 British Literature II ENG 2113 American Literature I ENG 2123 American Literature II ENG 253 Readings in World Literature</p> <p><b>Literature Electives - 9 hours (take 3 of 5)*</b> ENG 263 Themes in Literature ENG 3303 The Bible as Literature ENG 3313 Graphic Novels ENG 423 Drama ENG 443 Poetry <i>*Or upper division literature course as approved by advisor</i></p>				



<b>Professional Education Courses</b> <b>42 hours</b>	<b><u>Professional Education Requirements</u></b> EDU 111 Freshman Practicum EDU 211 Sophomore Practicum EDU 232 Educational Psychology for Middle & Secondary School Teachers EDU 301 Instructional Design Practicum EDU 303 Instructional Design EDU 312 Exceptional Children in Schools EDU 322 Culturally Responsive Teaching EDU 331 Reading in the Content Area Practicum EDU 332 Reading in the Content Area EDU 362 Classroom Behavior & Environment EDU 411 Middle School Practicum EDU 412 The Middle School EDU 422 Middle School Methods EDU 431 Secondary Methods Practicum EDU 442 Secondary Methods EDU 462 Educational Measurement EDU 463 Educational Media & Technology EDU 470 Student Teaching EDU 482 Student Teaching Seminar
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**TOTAL IN DEGREE PROGRAM:**

**120 HRS.**

**BACHELOR OF SCIENCE HEALTH/PHYSICAL EDUCATION (P-12) 120 HRS.**

To be eligible for licensure as a health and/or physical education teacher in grades P-12, the following program of study must be completed.

	Mathematics	Science	Hum/SS	Communication	Other
General Education 42 hours	MA 113 <i>or</i> MA 153	BIO 104 BIO 154	ENG 153 HUM Elect (3) PSY 113 EDU 473	ENG 103 ENG 113 SP 203 <i>or</i> COM 163	EXS 102 EDU 222 EDU 232 EDU 463  Gen Ed Elec. (1)* *Specific electives required to complete a coaching minor
Other 6 hours	5 Hours Free Electives Electives are determined in conjunction with an advisor and based on student career objectives				UE 101
Health and Physical Education Courses 30 hours	<u>Content Requirements</u> EXS 103 Teaching Sport & Recreation Activities I EXS 123 Teaching Sport & Recreation Activities II EXS 233 Drug Education EXS 243 Athletic Training EXS 263 Motor Learning EXS 273 Nutrition EXS 333 Kinesiology EXS 373 Health Promotion & Problems SM 223 History of PE & Sport MGT 303 Risk Management				
Professional Education Courses 42 hours	<u>Professional Education Requirements</u> EDU 111 Freshman Practicum EDU 211 Sophomore Practicum EDU 212 Introduction to Music Fundamentals EDU 242 PE for the Elementary Teacher EDU 252 School & Community Health EDU 301 Instructional Design Practicum EDU 303 Instructional Design EDU 312 Exceptional Children in Schools EDU 322 Culturally Responsive Teaching EDU 331 Reading in the Content Area Practicum EDU 332 Reading in the Content Area EDU 362 Classroom Behavior & Environment EDU 412 The Middle School EDU 422 Middle School Methods EDU 431 Secondary Methods Practicum EDU 442 Secondary Methods EDU 462 Educational Measurement EDU 470 Student Teaching EDU 482 Student Teaching Seminar				

**TOTAL IN DEGREE PROGRAM:**

**120 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
<b>General Education</b> 42 hours	MA 134  Math or Science Elect (2)	Science (3)	ENG 153 HUM Elect (3) PSY 113 EDU 473	ENG 103 ENG 113  SP 203 <i>or</i> COM 163	EDU 463 EDU 232 Gen Ed Elec. (6)
<b>Other</b> 13 hours	12 Hours Free Electives Electives are determined in conjunction with an advisor and based on student career objectives				UE 101
<b>Mathematics Content Area Courses</b> 28 hours	<p><b><u>Content Requirements</u></b></p> <p>MA 164 Calculus II MA 213 Calculus III MA 233 Differential Equations MA 303 College Geometry MA 313 Linear Algebra MA 343 Sets &amp; Logic MA 373 Abstract Algebra MA 393 Probability &amp; Statistics MA 473 Graphic Theory &amp; Combinatorics</p>				
<b>Professional Education Courses</b> 37 hours	<p><b><u>Professional Education Requirements</u></b></p> <p>EDU 111 Freshman Practicum EDU 211 Sophomore Practicum EDU 301 Instructional Design Practicum EDU 303 Instructional Design EDU 312 Exceptional Children in Schools EDU 322 Culturally Responsive Teaching EDU 331 Reading in the Content Area Practicum EDU 332 Reading in the Content Area EDU 362 Classroom Behavior &amp; Environment EDU 431 Secondary Methods Practicum EDU 442 Secondary Methods EDU 462 Educational Measurement EDU 411 Middle School Practicum EDU 412 The Middle School EDU 422 Middle School Methods EDU 470 Student Teaching EDU 482 Student Teaching Seminar</p>				

**TOTAL IN DEGREE PROGRAM:**

**120 HRS.**

**BACHELOR OF SCIENCE**

**EDUCATION/LIFE SCIENCES-(BIOLOGY) (5-12)**

**120 HRS.**

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

	<b>Mathematics</b>	<b>Science</b>	<b>Hum/SS</b>	<b>Communication</b>	<b>Other</b>
<b>General Education</b> 42 hours	MA 113  MA 123 <i>or</i> MA 134	CH 104 BIO 114	ENG 153 HUM Elect (3) PSY 113 EDU 473	ENG 103 ENG 113  SP 203 <i>or</i> COM 163	CH 114 EDU 463
<b>Other</b> 7-8 hours	6-7 Hours Free Electives Electives are determined in conjunction with an advisor and based on student career objectives.				UE 101
<b>Content Requirements</b> 31 hours	<b><u>Content Requirements</u></b> BIO 124 Principles of Biology II BIO 154 Basic Human Anatomy & Physiology BIO 304 Plant Biology BIO 314 Animal Biology BIO 324 Microbiology BIO 334 Environmental Biology BIO 343 Cell Biology BIO 414 Genetics				
<b>Professional Education Requirements</b> 39 hours	<b><u>Professional Education Requirements</u></b> EDU 111 Freshman Practicum EDU 211 Sophomore Practicum EDU 232 Educational Psychology for Middle & Secondary School Teachers EDU 301 Instructional Design Practicum EDU 303 Instructional Design EDU 312 Exceptional Children in Schools EDU 322 Culturally Responsive Teaching EDU 331 Reading in the Content Area Practicum EDU 332 Reading in the Content Area EDU 362 Classroom Behavior & Environment EDU 431 Secondary Methods Practicum EDU 442 Secondary Methods EDU 462 Educational Measurement EDU 411 Middle School Practicum EDU 412 The Middle School EDU 422 Middle School Methods EDU 470 Student Teaching EDU 482 Student Teaching Seminar				

**TOTAL IN DEGREE PROGRAM:**

**120 HRS.**

**BACHELOR OF SCIENCE****SCIENCE EDUCATION/CHEMISTRY (5-12)****120 HRS.**

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

	Mathematics	Science	Hum/SS	Communication	Other
General Education 44 hours	MA 134 MA 164	CH 104 CH 114 PH 224	ENG 153 HUM Elect (3) PSY 113 EDU 473	ENG 103 ENG 113  SP 203 <i>or</i> COM 163	EDU 463
Other 7 hours	6 Hours Free Electives Electives are determined in conjunction with an advisor and based on student career objectives				UE 101
Chemistry Content Area Courses 30 hours	<u>Content Requirements</u> CH 204 Organic Chemistry I CH 214 Organic Chemistry II CH 234 Quantitative Analysis CH 344 Inorganic Chemistry CH 324 Chemical Instrumental Analysis & Laboratory CH 353/351 Physical Chemistry I & Laboratory CH 434 Biochemistry I MA 213 Calculus III				
Professional Education Courses 39 hours	<u>Professional Education Requirements</u> EDU 111 Freshman Practicum EDU 211 Sophomore Practicum EDU 232 Educational Psychology for Middle & Secondary School Teachers EDU 301 Instructional Design Practicum EDU 303 Instructional Design EDU 312 Exceptional Children in Schools EDU 322 Culturally Responsive Teaching EDU 331 Reading in the Content Area Practicum EDU 332 Reading in the Content Area EDU 362 Classroom Behavior & Environment EDU 431 Secondary Methods Practicum EDU 442 Secondary Methods EDU 462 Educational Measurement EDU 411 Middle School Practicum EDU 412 The Middle School EDU 422 Middle School Methods EDU 470 Student Teaching EDU 482 Student Teaching Seminar				

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

**BACHELOR OF SCIENCE**

**SOCIAL STUDIES EDUCATION (5-12) 120 HRS.**

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

	Mathematics	Science	Hum/SS	Communication	Other
<b>General Education</b> 42 hours	MA 113 <i>or</i> MA 153  Math or Science Elect (3)	Science (3)	ENG 153 HUM Elect (3) PSY 113 HIS 103	ENG 103 ENG 113  SP 203 <i>or</i> COM 163	HIS 113 HIS 203 POLS 113 GEO 213
<b>Other</b> 6 Hours	5 Hours Free Electives Electives are determined in conjunction with an advisor and based on student career objectives				UE 101
<b>Social Studies Content Area Courses</b> 27 hours	<p><b><u>Content Requirements</u></b>                      HIS 213 World Civilization II                      ECO 223 Principles of Macroeconomics                      SOC 103 Principles of Sociology</p> <p><b><i>At least TWO of the following concentrations:</i></b></p> <p><b>Economics</b>                      ECO 213 Principles of Microeconomics                      FIN 343 International Finance                      FIN 353 Personal Finance</p> <p><b>Government and Citizenship</b>                      POLS 313 Comparative Governments                      POLS 333 State &amp; Local Government                      POLS 403 American Constitutional Development</p> <p><b>Historical Perspectives</b>                      HIS 323 The Contemporary World                      HIS 343 American Political Thought                      HIS 263 Indiana History</p> <p><b>Psychology</b>                      PSY 323 Abnormal Psychology                      PSY 343 Social Psychology                      PSY 353 Child &amp; Adolescent Psychology</p>				

<b>Professional Education Courses</b> <b>45 hours</b>	<p><b><u>Professional Education Requirements</u></b></p> <p>EDU 111 Freshman Practicum  EDU 211 Sophomore Practicum  EDU 232 Educational Psychology for Middle &amp; Secondary School Teachers  EDU 301 Instructional Design Practicum  EDU 303 Instructional Design  EDU 312 Exceptional Children in Schools  EDU 322 Culturally Responsive Teaching  EDU 331 Reading in the Content Area Practicum  EDU 332 Reading in the Content Area  EDU 362 Classroom Behavior &amp; Environment  EDU 431 Secondary Methods Practicum  EDU 442 Secondary Methods  EDU 462 Educational Measurement  EDU 463 Educational Media &amp; Technology  EDU 411 Middle School Practicum  EDU 412 The Middle School  EDU 422 Middle School Methods  EDU 470 Student Teaching  EDU 473 Issues in American Public Education  EDU 482 Student Teaching Seminar</p>
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**TOTAL IN DEGREE PROGRAM:**

**120 HRS.**

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

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

- DEPARTMENT OF CRIMINAL JUSTICE
- DEPARTMENT OF HUMANITIES AND COMMUNICATION
- DEPARTMENT OF MATHEMATICS AND PHYSICS
- DEPARTMENT OF MUSIC
- DEPARTMENT OF PSYCHOLOGY AND SOCIAL SCIENCES
- DEPARTMENT OF SPORT AND RECREATION
- MATHEMATICS HELP SESSIONS
- WRITING CENTER

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

ASSOCIATE IN ARTS

ASSOCIATE IN CRIMINAL JUSTICE

ASSOCIATE IN SCIENCE WITH AN EMPHASIS IN MATHEMATICS

ASSOCIATE IN GENERAL STUDIES

BACHELOR OF ARTS WITH MAJORS IN:

- COMMUNICATION
- ENGLISH
- GENERAL STUDIES

BACHELOR OF SCIENCE WITH MAJORS IN:

- CRIMINAL JUSTICE
- MATHEMATICS
- PSYCHOLOGY
- SPORT AND RECREATION

[MINORS](#)



**THE SCHOOL**

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

**JANNEN 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 WITH AN EMPHASIS IN MATHEMATICS
- ASSOCIATE IN GENERAL STUDIES

**ASSOCIATE IN ARTS**

**60 HRS.**

	Mathematics	Science	Hum/SS	Communication	Other
<b>General Education</b> 22 hours	Math Elective (3)	Lab Science Elective (4)	HUM Elect (3) SOC SCI Elect (3)	ENG 103  ENG 113 Or ENG 133	Gen Ed Electives (3)
<b>Additional Requirements</b> 14 hours					UE 101 SP 203  Electives (10)
<b>Content Requirements</b> 24 hours	<b>Choose 24 hours in one of the following areas:</b> 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> 21 hours	Math Elective (3)	Science Elective (3)	SOC 103 HUM Elect (3)	ENG 103  ENG 113 Or ENG 133	Gen Ed Elective (3)
<b>Additional Requirements</b> 15 hours					UE 101 Electives (14)
<b>Content Requirements</b> 24 hours	LE 103 Introduction to Criminal Justice LE 153 Juvenile Justice LE 253 Probation, Parole & Community Corrections LE 263 Introduction to Criminal Law & Justice LE 273 Criminal Procedures & Evidence LE 343 Criminalistics & Crime Scene Investigations I PSY 113 Principles of Psychology PSY 383 Forensic Psychology				

**TOTAL IN DEGREE PROGRAM:**

**60 HRS.**

**ASSOCIATE IN SCIENCE WITH AN EMPHASIS IN MATHEMATICS 60 HRS**

	Mathematics	Science	Hum/SS	Communication	Other
<b>General Education</b> 22 hours	Math Elective (3)	Lab Science Elective (4)	SOC SCI Elect (3)  HUM Elect (3)	ENG 103  ENG 113 Or ENG 133	Gen Ed Electives (3)
<b>Additional Requirements</b> 18 hours					UE 101 (1) Electives (17)
<b>Content Requirements</b> 20 hours	Mathematics courses (20) <i>Student must complete 20 total hours in mathematics</i>				

**TOTAL IN DEGREE PROGRAM:**

**60 HRS.**

**ASSOCIATE IN GENERAL STUDIES**

**60 HRS**

	Mathematics	Science	Hum/SS	Communication	Other
<b>General Education Requirements</b> 22 hours	Math Elective (3)	Science Elective (3)	SOC SCI Elect (3) HUM Elect (3)	ENG 103  ENG 113 OR ENG 133 OR COM 213	Gen Ed Electives (4)
<b>Additional Requirements</b> 1 hours					UE 101
<b>Content Requirements</b> 37 hours	37 Credit hours, to include at least 9 hours earned in each of the two academic departments.				

**TOTAL IN DEGREE PROGRAM:**

**60 HRS.**

## **DEPARTMENT OF CRIMINAL JUSTICE**

**The Department of Criminal Justice offers the following degrees:**

BACHELOR OF SCIENCE WITH MAJORS IN:

- CRIMINAL JUSTICE

BACHELOR OF ARTS WITH A MAJOR IN:

- GENERAL STUDIES

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

### **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 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.

**BACHELOR OF SCIENCE – CRIMINAL JUSTICE MAJOR**

**120 HRS.**

	Mathematics	Science	Hum/SS	Communication	Other
<b>General Education</b> 42 hours	Math Elec (3)  Math or	BIO 1003  Science Elect (3)	HUM Elect (3) HUM Elect (3)  HIS 103 <b>and</b> HIS 113 <b>Or</b> HIS 203 <b>and</b> HIS 213	ENG 103 ENG 113  SP 203 <b>or</b> COM 163	SOC 103 POLS 113 PSY 113  Gen Ed Elect (3)
<b>Content Requirements</b> 63 hours	<p>UE 101 University Experience LE 103 Introduction to Criminal Justice LE 153 Juvenile Justice LE 253 Probation, Parole, &amp; Community Corrections LE 263 Introduction to Criminal Law &amp; Justice LE 273 Criminal Procedures &amp; Evidence LE 343 Criminalistics &amp; Crime Scene Investigations I POLS 333 State &amp; Local Government POLS 403 American Constitutional Development PSY 383 Forensic Psychology</p> <p>LE 433 Criminal Justice Capstone Demonstration <b>Or</b> LE 473 Law Enforcement Internship I</p> <p><b><u>32 Hours Free Electives</u></b> Electives are determined in conjunction with an advisor and based on student career objectives.</p>				
<b>Concentrations</b> 15 hours	<p><b>Select one of the following five concentrations. (15 Hours)</b></p> <p><b><u>Option A - Law Enforcement</u></b> LE 313 Police Administration LE 353 Criminalistics &amp; Crime Scene Investigations II LE 423 Criminal Justice Agency Administration PSY 443 Advanced Forensic Psychology SOC 323 The Family</p> <p><b><u>Option B - Forensic/Correctional Psychology</u></b> LE 363 Institutional Corrections &amp; Correctional Law PSY 323 Abnormal Psychology PSY 413 The Psychology of Addiction PSY 423 Counseling Theories &amp; Practices PSY 443 Advanced Forensic Psychology</p> <p><b><u>Option C - Agency Administration</u></b> LE 313 Police Administration LE 363 Institutional Corrections &amp; Correctional Law LE 423 Criminal Justice Agency Administration MGT 313 Human Resources Management MGT 363 Organizational Behavior</p> <p><b><u>Option D - Psychology</u></b> PSY 323 Abnormal Psychology PSY 333 Psychology of Personality PSY 343 Social Psychology PSY 353 Child &amp; Adolescent Psychology <b>Or</b> PSY 223 Lifespan Developmental Psychology PSY 423 Counseling Theories &amp; Practices</p> <p><b><u>Option E - Indiana Law Enforcement</u></b> LE 4015 Successful completion of Indiana Law Enforcement Academy Basic Police Training Course</p>				

**TOTAL IN DEGREE PROGRAM:**

**120 HRS.**

**BACHELOR OF ARTS - GENERAL STUDIES MAJOR**

**120 HRS.**

	Mathematics	Science	Hum/SS	Communication	Other
General Education 42 hours	Math Elect (3)	Science Elect (4)  Science Elect (3)	HUM Elect (3) HUM Elect (3) HIS 103 HIS 113	ENG 103 ENG 113  SP 203	PSY 113  POLS 113 EXS 102 CSIT 103
Other 1 hour					UE 101
Content Requirements 48 hours	<p><b>Select one of the options below:</b>  <u><b>Option A - Pre-Legal Studies Concentration (48)</b></u>                      COM 213 Business Communication                      COM 363 Persuasion &amp; Argumentation                      ENG 2113 American Literature I                      POLS 333 State &amp; Local Government                      POLS 403 American Constitutional Development</p> <p>LE 153 Juvenile Justice, LE 263 Introduction to Criminal Law &amp; Justice, LE 273 Criminal Procedures &amp; 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><u><b>Option B - Self-Designed Studies Concentration (48)</b></u>                      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.**



## **DEPARTMENT OF HUMANITIES & COMMUNICATION**

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

BACHELOR OF ARTS WITH MAJORS IN:

- COMMUNICATION
- ENGLISH

The Department of Humanities and Communication promotes the intellectual and personal development of all students through a platform of humanistic experiences and application of concentrated practical communication skills while preparing majors to lead, succeed, and serve in their careers and lives. Students with English and Communication majors learn transferable skills through coursework and significant hands-on experience both on campus and in the community as part of their course work.

**BACHELOR OF ARTS—COMMUNICATION MAJOR**

**120 HRS.**

	Mathematics	Science	Hum/SS	Communication	Other
<b>General Education</b> 42 hours	Math Elect (3)  Math or Science Elect (3)	Science Elect (3)	FLM 203 Literature course (3) PSY 113 SOC SCI Elect (3)	ENG 103 ENG 113  SP 203	COM 123 COM 163 COM 203 General Ed Elect (3)
<b>Other</b> 15 hours	UE 101 Free Electives (14)				
<b>Students choose one of the following professional preparation tracks</b>					
<b>COM +</b> 15 hours	<b>COM+ Healthcare Administration</b> <i>primarily online</i> HC 313 (pending) HC 323 (pending) HC 413 PHL 353 (pending) MK 403 (pending)		<b>COM+ Leadership</b> <i>primarily online</i> LDR 103 LDR 203 LDR 303 LDR 333 LDR 403		<b>COM+ Information Systems</b> <i>primarily online</i> CSIT 103 CSIT 123 CSIT 223 INF 343 INF 263
	<b>COM+ Criminal Justice</b> LE 103 LE 153 LE 253 LE 263 LE 273		<b>COM+ Sports</b> <i>Angola campus only</i> EXS 103 EXS 123 EXS 203 EXS 221 EXS 483		<b>COM+ Environment*</b> <i>Angola campus only</i> Choose 15 hours: BIO 124/124L BIO 222 BIO 214/214L BIO 334/334L EAS 213 CE 3101 CE 3103** CE 4113
	<b>COM+ Strategic Focus</b> Choose at least 15 hours in consultation with your COM major advisor. These courses must be approved by the HAC department chair to ensure they meet professional track requirements.				

Trine University

<b>Content Requirements</b> <b>48 hours</b>	COM 111 Communication Practices & Professions COM 153 Principles of Public Relations COM 183 Writing for Media COM 213 Business Communication COM 233 Intercultural Communication COM 243 Digital Media Creation COM 253 Event Planning & Promotion COM 263 Communication Theories & Research COM 293 Argumentation & Debate COM 301 Media Practicum <b>(taken twice) (2)</b> COM 343 Web Content Management COM 353 Public Relations Writing & Production COM 363 Rhetoric & Persuasion COM 383 Advanced Writing for the Media COM 433 Media Law & Ethics COM 453 Public Relations Planning & Campaigns  COM 4013 Senior Capstone Internship <i>or</i> COM 4281 Senior Communication Proposal <i>and</i> COM 4292 Senior Communication Project
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\*COM+Environment may require pre-requisites. Students should consult with their advisor.

\*\*The pre-requisite of CH 114 is waived for COM+Environment students

**TOTAL IN DEGREE PROGRAM:**

**120 HRS.**

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**BACHELOR OF ARTS—ENGLISH MAJOR**

**120 HRS.**

	Mathematics	Science	Hum/SS	Communication	Other
General Education 42 hours	Math Elect (3)  Math or Science Elect (3)	Science Elect (3)	ENG 153 ENG 363 PSY 113 SOC SCI Elect (3)	ENG 103 ENG 113 SP 203	ENG 433 COM 203 COM 363 Gen Ed Elect (3)
Add'l 33 hours					UE 101 Free electives (32)
Content Requirements 45 hours	<p><b><u>COMPOSITION CORE - 21 HRS.</u></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 &amp; Promotion</li> <li>- COM 343 Web Content Management</li> <li>- COM 353 PR Writing &amp; Production</li> <li>- COM 383 Advanced Writing for the Media</li> <li>- COM 413 Corporate &amp; Organizational Communication</li> <li>- COM 483 Public Affairs Reporting</li> <li>- or other communication course approved by advisor</li> </ul> <p><b><u>LITERATURE CORE - 21 HRS.</u></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><u>PROGRAM CORE - 3 HRS.</u></b>                      ENG 4013 Capstone Study in English                      OR                      ENG 4023 Senior Capstone Internship</p>				

**TOTAL IN DEGREE PROGRAM:**

**120 HRS.**

## **DEPARTMENT OF MATHEMATICS AND PHYSICS**

**The Department of Mathematics and Physics offers the following degree:**

**BACHELOR OF SCIENCE WITH MAJORS IN:**

- MATHEMATICS

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

**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 Elect (3) SOC SCI Elect (3) HUM Elect (3) HUM Elect (3)	ENG 103 ENG 113  SP 203 <i>or</i> COM 163	INF 143 <i>or</i> CS 1113  ENG 153 PSY 113 EXS 102
<b>Content Requirements</b> 38 hours	<p><i>A grade of "C" or higher is required for each mathematics course in the major.</i></p> <p>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                      MA 473 Graph Theory &amp; Combinatorics                      Mathematics Electives (12)</p>				
<b>Additional</b> 40 hours	<p>Directed electives (22-26)                      General Electives (13-17)                      UE 101 University Experience</p>				

**TOTAL IN DEGREE PROGRAM:**

**120 HRS**

**DEPARTMENT OF PSYCHOLOGY AND SOCIAL SCIENCES**

**The Department of Psychology and Social Sciences offers the following degree:**

BACHELOR OF SCIENCE WITH MAJORS IN:

- PSYCHOLOGY

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

**BACHELOR OF SCIENCE – PSYCHOLOGY MAJOR**

**120 HRS.**

	Mathematics	Science	Hum/SS	Communication	Other
<b>General Education</b> 42 hours	MA Elect (3)  Math Or	BIO 1003  Science Elect (3)	HUM Elect (3) HUM Elect (3)  SOC SCI Elect (3) POLS 113	ENG 103 ENG 113  SP 203 <i>or</i> COM 163	PSY 113 Gen Ed Elect (3)  HIS 103 <i>and</i> HIS 113 <b>or</b> HIS 203 <i>and</i> HIS 213
<b>Additional I</b> 36 hours	UE 101  <b>35 Hours Free Electives</b> Students wishing to pursue graduate training in psychology should take: MA 113 College Algebra and MA 253 Statistics within these electives.				
<b>Content Requirements</b> 42 hours	<b>Required Core (6 hours)</b> PSY 303 Research Methods in Psychology <b>and</b> PSY 453 Clinical Internship <b>Or</b> PSY 473 Psychology Capstone Demonstration  <b>Subject Area Concentrations (18 hours)</b> <b>Choose three of the following clinical core courses (9 hours):</b> PSY 323 Abnormal Psychology PSY 363 Human Behavior & Counseling PSY 403 Human Sexuality PSY 413 The Psychology of Addiction PSY 423 Counseling Theories & Practices  <b>Choose two of the following social/cognitive core courses (6 hours):</b> PSY 333 Psychology of Personality PSY 343 Social Psychology PSY 373 Political Psychology  <b>Choose one of the following developmental core courses:</b> PSY 223 Lifespan Developmental Psychology PSY 353 Child & Adolescent Psychology SOC 323 The Family  <b>Additional Psychology Core Electives (18 hours)</b> <b>Choose 18 hours from any above subject area courses not used or from the list below.</b> PSY 313 Topics in Psychology PSY 383 Forensic Psychology PSY 433 Issues of Substance Abuse in Family Systems PSY 443 Advance Forensic Psychology PSY 483 Counseling Issues in Substance Abuse PSY 493 Issues & Ethics in Psychology & Counseling SOC 313 Topics in Sociology SOC 343 Social Psychology (Same as PSY 343) SM 393 Sport Psychology				

**TOTAL IN DEGREE PROGRAM:**

**120 HRS.**



**DEPARTMENT OF SPORT AND RECREATION**

**The Department of Sport and Recreation offers the following degree:**

BACHELOR OF SCIENCE WITH MAJORS IN:

- SPORT AND RECREATION

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

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

**BACHELOR OF SCIENCE — SPORT AND RECREATION MAJOR 120 HRS.**

	Mathematics	Science	Hum/SS	Communication	Other																																				
<b>General Education</b> 42 hours	MA 113  Math	Science Elect (4)  Or Science Elect (3)	HUM Elect (6) SOC SCI Elect (6)	ENG 103 ENG 113 SP 203	PSY 113 BA 113 POLS 113 EXS 102																																				
<b>Other</b> 4 hours	UE 101 University Experience BA 123 Business Concepts																																								
<b>Content Requirements</b> 45 hours	<p><b>Select 30 credit hours from either Column A or Column B and 15 credit hours from the other column for a total of 45 credit hours.</b></p> <table> <tr> <td><b>COLUMN A</b></td> <td><b>COLUMN B</b></td> </tr> <tr> <td>SM 133 Cont. Issues in Sport</td> <td>EXS 103 Teaching Sport Skills I</td> </tr> <tr> <td>SM 223 History of Sport</td> <td>EXS 123 Teaching Sport Skills II</td> </tr> <tr> <td>MGT 303 Risk Management</td> <td>EXS 221 Officiating</td> </tr> <tr> <td>SM 313 Principles of Sport &amp; Rec</td> <td>EXS 243 Athletic Training</td> </tr> <tr> <td>SM 393 Sport Psychology</td> <td>EXS 263 Motor Learning</td> </tr> <tr> <td>MGT 323 Leadership</td> <td>EXS 273 Nutrition</td> </tr> <tr> <td>MGT 363 Organizational Behavior</td> <td>EXS 283 Fitness Evaluation Assessments</td> </tr> <tr> <td>MGT 373 Facility Management</td> <td>EXS 233 Drug Education</td> </tr> <tr> <td>MK 203 Marketing</td> <td>EXS 333 Kinesiology</td> </tr> <tr> <td>MGT 383 Project Management</td> <td>EXS 343 Human Performance</td> </tr> <tr> <td>MGT 403 Hospitality Management</td> <td>EXS 353 Exercise Physiology</td> </tr> <tr> <td>SM 413 Admin. Of P.E./Athletic Prog.</td> <td>EXS 373 Health Promotion &amp; Problems</td> </tr> <tr> <td>BA 3113 Business Internship</td> <td>EXS 383 Nutrition Counseling</td> </tr> <tr> <td></td> <td>EXS 393 Adv. Athletic Training</td> </tr> <tr> <td></td> <td>EXS 413 Corrective Exercise</td> </tr> <tr> <td></td> <td>EXS 493 Strength &amp; Conditioning Prep</td> </tr> <tr> <td></td> <td>EXS 483 Professional Development</td> </tr> </table>					<b>COLUMN A</b>	<b>COLUMN B</b>	SM 133 Cont. Issues in Sport	EXS 103 Teaching Sport Skills I	SM 223 History of Sport	EXS 123 Teaching Sport Skills II	MGT 303 Risk Management	EXS 221 Officiating	SM 313 Principles of Sport & Rec	EXS 243 Athletic Training	SM 393 Sport Psychology	EXS 263 Motor Learning	MGT 323 Leadership	EXS 273 Nutrition	MGT 363 Organizational Behavior	EXS 283 Fitness Evaluation Assessments	MGT 373 Facility Management	EXS 233 Drug Education	MK 203 Marketing	EXS 333 Kinesiology	MGT 383 Project Management	EXS 343 Human Performance	MGT 403 Hospitality Management	EXS 353 Exercise Physiology	SM 413 Admin. Of P.E./Athletic Prog.	EXS 373 Health Promotion & Problems	BA 3113 Business Internship	EXS 383 Nutrition Counseling		EXS 393 Adv. Athletic Training		EXS 413 Corrective Exercise		EXS 493 Strength & Conditioning Prep		EXS 483 Professional Development
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	EXS 483 Professional Development																																								
<b>Add'l</b> 29 hours	<b>Electives to be determined with Advisor (29)</b>																																								

**TOTAL IN DEGREE PROGRAM:**

**120 HRS.**

## **RINKER-ROSS SCHOOL OF HEALTH SCIENCES**

Trine University's Rinker-Ross School of Health Sciences includes:

### **Carew Street Campus Programs**

- [DOCTORATE OF PHYSICAL THERAPY](#)
- [MASTER OF PHYSICIAN ASSISTANT STUDIES](#)
- ASSOCIATE OF APPLIED SCIENCE IN PHYSICAL THERAPIST ASSISTANT
- ASSOCIATE OF APPLIED SCIENCE IN SURGICAL TECHNOLOGY

### **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

### **The Department of Exercise Science**

- BACHELOR OF SCIENCE WITH A MAJOR IN EXERCISE SCIENCE

### **The Department of Science**

- ASSOCIATE IN SCIENCE WITH AN EMPHASIS IN SCIENCE
- BACHELOR OF SCIENCE WITH A MAJOR IN:
  - BIOCHEMISTRY
    - TRADITIONAL TRACK
    - PHYSICIAN ASSISTANT TRACK
    - PRE-MEDICAL TRACK
  - BIOLOGY
    - TRADITIONAL TRACK
    - PHYSICIAN ASSISTANT TRACK
    - PHYSICAL THERAPY TRACK
    - PRE-MEDICAL TRACK
  - CHEMISTRY
    - TRADITIONAL TRACK
    - PHYSICIAN ASSISTANT TRACK
    - PRE-MEDICAL TRACK
  - FORENSIC SCIENCE
    - BIOLOGY CONCENTRATION
    - CHEMISTRY CONCENTRATION

### **[MINORS](#)**

**ASSOCIATE OF APPLIED SCIENCE  
IN PHYSICAL THERAPIST ASSISTANT\***

**75 HR**

The program is located in the Health Sciences Education Center at the Carew Street Campus.

**RECOMMEND SEQUENCE OF COURSES**

<b>FALL YEAR 1</b>	
ENG 103 English Composition I	3
HS 104 Anatomy & Physiology I	4
MA 113 College Algebra	3
PTA 112 Health Behavior Science	2
PTA 113 Clinical Practice I	3
PTA 133 Professional Development I	3
<b>Total Credits</b>	<b>18</b>
<b>SPRING YEAR 1</b>	
HS 114 Anatomy & Physiology II	4
PH 154 College Physics & Lab	4
PTA 123 Clinical Practice II	3
PTA 143 Professional Development II	3
PTA 153 Kinesiology	3
<b>Total Credits</b>	<b>17</b>
<b>SUMMER YEAR 1</b>	
ENG 133 Technical Communications	3
PTA 203 Clinical Practice III	3
PTA 213 Special Topics	3
PTA 233 Musculoskeletal Rehabilitation I	3
PTA 243 Neuromuscular Rehabilitation I	3
<b>Total Credits</b>	<b>15</b>
<b>FALL YEAR 2</b>	
PTA 202 Practical Research Methods	2
PTA 223 Lifespan	3
PTA 253 Musculoskeletal Rehabilitation II	3
PTA 263 Neuromuscular Rehabilitation II	3
PTA 273 Clinical Experience I	3
<b>Total Credits</b>	<b>14</b>
<b>SPRING YEAR 2</b>	
PTA 276 Clinical Experience II	6
PTA 286 Clinical Experience III	6
<b>Total Credits</b>	<b>12</b>
<b>PROGRAM TOTAL</b>	<b>76</b>

The PTA program will begin in Fall 2020.

The PTA program will open the application period in March 2019, and close applications for its charter class in March 2020.

*\*Graduation from a physical therapist assistant education program accredited by the Commission on Accreditation in Physical Therapy Education (CAPTE), 1111 North Fairfax Street, Alexandria, VA 22314; phone; 703-706-3245; accreditation@apta.org is necessary for eligibility to sit for the licensure examination, which is required in all states. Trine University is seeking accreditation of a new physical therapist assistant education program from CAPTE. The program is planning to submit an Application for Candidacy, which is the formal application required in the pre-accreditation stage, on 12/1/19. Submission of this document does not assure that the program will be granted Candidate for Accreditation status. Achievement of Candidate for Accreditation status is required prior to implementation of the technical phase of the program; therefore, no students may be enrolled in technical courses until Candidate for Accreditation status has been achieved. Further, though achievement of Candidate for Accreditation status signifies satisfactory progress toward accreditation, it does not assure that the program will be granted accreditation.*

**ASSOCIATE OF APPLIED SCIENCE IN SURGICAL TECHNOLOGY 71 HR**

The program is located in the Health Sciences Education Center at the Carew Street Campus.

**RECOMMEND SEQUENCE OF COURSES**

<b>FALL YEAR 1</b>	
HS 104 Medical Anatomy & Physiology I	4
BIO 163 Medical Terminology	3
SUR 104 Introduction to Surgical Technology	4
SUR 114 Clinical Experience I	4
ENG 103 English Composition I	3
<b>Total Credits</b>	<b>18</b>
<b>SPRING YEAR 1</b>	
HS 114 Medical Anatomy & Physiology II	4
BIO 123 Microbiology	3
SUR 134 Surgical Procedures I	4
SUR 124 Clinical Experience II	4
ENG 113 English Composition II	3
<b>Total Credits</b>	<b>18</b>
<b>SUMMER YEAR 1</b>	
BIO 212 Pharmacology	2
SUR 234 Surgical Procedure II	4
SUR 218 Clinical Experience III	8
PSY 113 Principles of Psychology	3
<b>Total Credits</b>	<b>17</b>
<b>FALL YEAR 2</b>	
SUR 244 Surgical Procedures III	4
SUR 228 Clinical Experience IV	8
SUR 223 Surgical Technology Capstone	3
MA 113 College Algebra	3
<b>Total Credits</b>	<b>18</b>
<b>PROGRAM TOTAL</b>	<b>71</b>

### 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
CSIT 103 Intro to Information Systems	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 133 Technical Communication	3
EXS 102 Lifetime Wellness	2
PSY 113 Principles of Psychology	3
<b>Total Credits</b>	<b>16</b>
<b>SOPHOMORE FALL</b>	
BIO 384 Human Anatomy & Physiology I	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 394 Human Anatomy & Physiology II	4
ENG 153 Introduction to Literature	3
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 324 Microbiology	4
PH 164 College Physics II	4
BIO 364 Toxicology	4
ENG 453 Advanced Composition	3
<b>Total Credits</b>	<b>15</b>

<b>JUNIOR SUMMER – DPT Program Acceptance</b>	
SCI 434 Senior Internship	4
<b>Total Credits</b>	<b>4</b>
<b>Courses to complete as part of the 1<sup>st</sup> Year DPT Program</b>	
<b>DPT FALL I</b>	
DPT 5111 CARE I	1
DPT 5124 Anatomy of Movement I	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>
<b>Courses to complete for BS Biology if not pursuing the DPT Program</b>	
<b>SENIOR FALL AND SPRING</b>	
BIO XX3 Biology Elective	3
Electives	21
SCI 434 Senior Internship	4
<b>Total Credits</b>	<b>28</b>

### 3+ 3 DEGREE PATH FOR A BACHELOR OF SCIENCE IN EXERCISE SCIENCE & A DOCTORATE IN PHYSICAL THERAPY

#### RECOMMEND SEQUENCE OF COURSES

<b>FRESHMAN FALL</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>FRESHMAN SPRING</b>	
EXS 123 Teaching of Sport Skills II	3
ENG 133 Technical Communication	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>SOPHOMORE FALL</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>SOPHOMORE SPRING</b>	
CH 114 General Chemistry II (or honors)	4
PH 154 College Physics I	4
EXS 233 Drug Education	3
EXS 273 Nutrition	3
Humanities elective	3
<b>Total Credits</b>	<b>17</b>
<b>JUNIOR FALL</b>	
PH 164 College Physics II	4
BIO 384 Anatomy & Physiology I	4
EXS 383 Nutrition Counseling	3
EXS 333 Kinesiology	3
EXS 373 Health Promotion & Problems	3
<b>Total Credits</b>	<b>17</b>
<b>JUNIOR SPRING</b>	
BIO 394 Anatomy & Physiology II	4
MA 253 Statistics	3
EXS 353 Exercise Physiology	3
EXS 263 Motor Learning	3
ENG 453 Advanced Composition	3
<b>Total Credits</b>	<b>16</b>

<b>DPT FALL I</b>	
<b>Courses to complete as part of the 1<sup>st</sup> Year DPT Program</b>	
DPT 5124 Anatomy of Movement I	4
DPT 5134 Applied Physiology I	4
DPT 5152 Health Behavior Science	2
<b>Total Credits</b>	<b>10</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>
<b>Courses to Complete for BS EXS if not pursuing the DPT Program</b>	
<b>SENIOR FALL</b>	
MGT 303 Risk Management	3
SM 313 Prin of Sport & Rec	3
SM 412 Bus Plng in Sprt & Rec	2
EXS 283 Fitness Eval Assmt	3
EXS 343 Human Performance	3
<b>Total Credits</b>	<b>14</b>
<b>SENIOR SPRING</b>	
EXS 433 Dev Health Prom	3
EXS 464 Capstone	4
EXS 474 Internship	4
EXS 493 Strength & Cond Prep	3
<b>Total Credits</b>	<b>14</b>

## PROFESSIONAL TRACKS

The Department of Exercise Science also helps to coordinate the following program:

- Pre-Med Professional Track
- Pre-Physical Therapy Professional Track

### PRE-MED PROFESSIONAL TRACK 51-53 HRS

The Pre-Med Professional Track can be associated with any major offered at Trine University and is designed for students interested in preparing themselves for a career in health sciences. In conjunction with, or in addition to, the curricular requirements of the major, the Pre-Med Professional Track requires coursework in the following areas:

<b>Pre-Med Professional Track Requirements 51-53 hours</b>	<b>Pre-Med Professional Track Requirements (51-53)</b> BIO 114 Principles of Biology I  BIO 124 Principles of Biology II OR BIO 343 Cell Biology  CH 104 General Chemistry I and CH 114 General Chemistry II OR CH 155 Honors Advanced General Chemistry  CH 204 Organic Chemistry I CH 214 Organic Chemistry II CH 434 Biochemistry I  MA 134 Calculus I MA 253 Statistics  PH 154 College Physics I and PH 164 College Physics II OR PH 224 University Physics I and PH 234 University Physics II  PSY 113 Principles in Psychology SOC 103 Sociology PHL 313 Ethics
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**TOTAL IN PRE-MED PROFESSIONAL TRACK**

**51-53 HRS**

To be competitive Medical School Applicant, students in the track must achieve at least a “B+” grade in all science courses listed above. Honors courses are highly recommended. Students must maintain a GPS of 3.5 or better remain in the pre-med track. Students meet regularly with the Pre-Health advisor to assess readiness for the medical school application process. Interested student should self-enroll using the Pre-Health Science Declaration Form found in myPortal, on the Student tab, during the annual open enrollment period in November.



**PRE-PHYSICAL THERAPY PROFESSIONAL TRACK**

**41 HRS.**

The Pre-Physical Therapy Professional Track can be associated with any major offered at Trine University, though majors in the School of Health Sciences provide the clearest path to successful entry into a Doctor of Physical Therapy degree program. In conjunction with, or in addition to, the curricular requirements of the major, the Pre-Physical Therapy Professional Track requires coursework in the following area:

**PRE-PHYSICAL THERAPY PROFESSIONAL TRACK**

**41 HRS.**

<b>Pre-Med Professional Track Requirements 41 hours</b>	<b>Pre-Physical Therapy Professional Track Requirements (41)</b> Biological Sciences –(excluding botany & zoology) (8) BIO 384 Human Anatomy & Physiology I BIO 394 Human Physiology & Physiology II CH 104 General Chemistry I CH 114 General Chemistry II ENG 453 Advanced Composition MA 253 Statistics  PH 154 College Physics I and PH 164 College Physics II OR PH 224 University Physics I and PH 234 University Physics II  Psychology Elective (3)
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Also, students must maintain a cumulative GPA of 3.5 or better to stay in the track. They are evaluated during their final year via benchmark interviews that address the following characteristics of a successful physical therapy program applicant: development of personal and professional qualities; physical therapy or graduate school applications; and community service, clinical observation and leadership experiences.

**DEPARTMENT OF EXERCISE SCIENCE**

The Department of Exercise Science offers the following degree:

BACHELOR OF SCIENCE WITH A MAJOR IN:

- EXERCISE SCIENCE

**BACHELOR OF SCIENCE — EXERCISE SCIENCE MAJOR 121 HRS.**

	Mathematics	Science	Hum/SS	Communication	Other
<b>General Education</b> 42 hours	MA 113 MA 253	BIO 114	PSY 113 SM 393  HUM Elect (6)	ENG 103 ENG 133  SP 203	BIO 124 or BIO 154  EXS 102  Gen Ed Elect (5)
<b>Content Requirements</b> 55 hours	<b>Program Requirements</b> EXS 103 Teaching Sport Skills I EXS 203 Risk & Sports EXS 233 Drug Education EXS 243 Athletic Training EXS 263 Motor Learning EXS 273 Nutrition EXS 283 Fitness Evaluation Assessments EXS 333 Kinesiology EXS 343 Human Performance EXS 353 Exercise Physiology EXS 363 Capstone for Exercise Science I EXS 373 Health Promotion & Problems EXS 383 Nutrition Counseling EXS 413 Corrective Exercise EXS 423 Evaluation of Athletic Injuries EXS 453 Capstone for Exercise Science II EXS 483 Professional Development in Exercise Science EXS 493 Strength & Conditioning Preparation  UE 101 University Experience				
<b>Add'l</b> 24 hours	<b>Electives to be determined with Advisor (24)</b>				

**TOTAL IN DEGREE PROGRAM:**

**121 HRS.**

## **DEPARTMENT OF SCIENCE**

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

ASSOCIATE IN SCIENCE WITH AN EMPHASIS IN SCIENCE

BACHELOR OF SCIENCE WITH A MAJOR IN:

- BIOCHEMISTRY
- BIOLOGY
- CHEMISTRY
- FORENSIC SCIENCE

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.

**ASSOCIATE IN SCIENCE WITH AN EMPHASIS IN SCIENCE**

**60 HRS**

	Mathematics	Science	Hum/SS	Communication	Other
<b>General Education</b> 22 hours	Math Elect (3)	Lab Science Elect (4)	SOC SCI Elect (3) HUM Elect (3)	ENG 103  ENG 113 Or ENG 133	Gen Ed Elect (3)
<b>Additional Requirements</b> 18 hours					UE 101 (1) Electives (17)
<b>Content Requirements</b> 20 hours	Science courses (20) <i>Student must complete 20 total hours in science</i>				

**TOTAL IN DEGREE PROGRAM:**

**60 HRS.**

**BACHELOR OF SCIENCE-BIOCHEMISTRY MAJOR**

**120 HRS**

	Mathematics	Science	Hum/SS	Communication	Other
<b>General Education 42hours</b>	MA 134 MA 253	BIO 114 CH 104 CH 114 CH 202	ENG 153 HUM Elect (3) PSY 113 SOC SCI Elect (3)	ENG 103  ENG 113 <i>or</i> ENG 133  SP 203 <i>or</i> COM 163	
<b>Program Requirements 78 hours</b>	<p><b><u>Biochemistry Core (46 credit hours)</u></b>                      UE 101 University Experience                      CH 204 Organic Chemistry I                      CH 214 Organic Chemistry II                      CH 234 Quantitative Chemical Analysis                      CH 302 Professional Practice in Science                      CH 324 Chemical Instrumental Analysis &amp; Laboratory                      CH 434 Biochemistry I                      CH 444 Biochemistry II                      BIO 324 Microbiology                      BIO 343 Cell Biology                      BIO 364 Toxicology                      BIO 414 Genetics                      BIO 454 Molecular Biology</p> <p><b>Choose one of the following 3 tracks in addition to the Biochemistry Core</b></p> <p><b><u>Traditional Track (32 credit hours)</u></b>                      MA 164 Calculus II                      MA 213 Calculus III                      CH 351 Physical Chemistry I Laboratory                      CH 353 Physical Chemistry                      PH 224 University Physics I                      PH 234 University Physics II                      SCI 412 Senior Research Seminar                      SCI 422 Senior Research Project                      4 Hours of Science Electives                      5 Hours of General Electives</p> <p><b><u>Physician Assistant Track (32 credit hours)</u></b>                      BIO 124 Principles of Biology II                      BIO 163 Medical Terminology                      BIO 384 Human Anatomy &amp; Physiology I                      BIO 394 Human Anatomy &amp; Physiology II                      SCI 434 Science Internship                      8 Hours of Science Electives                      5 Hours of General Electives</p>				

**Pre-Medical Track (32 credit hours)**

MA 164 Calculus II

MA 213 Calculus III

CH 351 Physical Chemistry I Laboratory

CH 353 Physical Chemistry I

PH 224 University Physics I

PH 234 University Physics II

SOC 103 Principles of Sociology

PHL 313 Ethics

3 Hours of Science Electives

SCI 412 Senior Research Seminar *and* SCI 422 Senior Research Project

*or*

SCI 434 Science Internship

**TOTAL IN DEGREE PROGRAM:**

**120 HRS**

**BACHELOR OF SCIENCE – BIOLOGY MAJOR**

**120 HRS**

	Mathematics	Science	Hum/SS	Communication	Other
<b>General Education</b> 42 hours	MA 113 MA 123 MA 253	PH 154 CH 104 CH 114	ENG 153 HUM Elect (3) PSY 113/113H SOC SCI Elect (3)	ENG 103  ENG 113 <i>or</i> ENG 133  SP 203 <i>or</i> COM 163	
<b>Program Requirements</b> 78 hours	<p><b>Biology Core (36 credit hours)</b>                      UE 101 University Experience                      CH 204 Organic Chemistry I                      PH 164 College Physics II                      BIO 114 Principles of Biology I                      BIO 124 Principles of Biology II                      BIO 202 Introduction to Biological Literature &amp; Communication                      BIO 274 General Ecology                      BIO 302 Professional Practice in Science                      BIO 343 Cell Biology                      BIO 414 Genetics                      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 4 tracks in addition to the Biology Core:</b></p> <p><b><u>Traditional Track (42 credit hours)</u></b>  <b>Choose one of the following physiology classes (4 credit hours):</b>                      BIO 304 Plant Biology                      BIO 384 Human Anatomy &amp; Physiology I  <b>Choose one of the following natural science classes (4 credit hours):</b>                      BIO 214 Conservation                      BIO 284 Aquatic Biology                      BIO 334 Environmental Biology  <b>Choose one of the following organism classes (4 credit hours):</b>                      BIO 304 Plant Biology                      BIO 314 Animal Biology                      BIO 324 Microbiology</p> <p><b>Electives:</b>                      10 credit hours of Biology Electives                      4 credit hours of Chemistry or Math Electives                      16 credit hours of General Electives</p>				

**Physician Assistant Track (42 credit hours)**

BIO 163 Medical Terminology  
BIO 324 Microbiology  
BIO 384 Human Anatomy & Physiology I  
BIO 394 Human Anatomy & Physiology II  
BIO 434 Biochemistry I  
BIO 444 Biochemistry II  
7-8 credit hours of General Electives

**Choose two of the following (7-8 credit hours):**

BIO 364 Toxicology  
BIO 404 Embryology  
BIO 443 Pathology  
BIO 454 Molecular Biology

**Choose one of the following natural science classes (4 credit hours):**

BIO 214 Conservation  
BIO 334 Environmental Biology  
BIO 284 Aquatic Biology

**Physical Therapy Track (42 credit hours)**

ENG 453 Advanced Composition  
BIO 324 Microbiology  
BIO 334 Environmental Biology  
BIO 364 Toxicology  
BIO 384 Human Anatomy & Physiology I  
BIO 394 Human Anatomy & Physiology II  
3 credit hours of Biology Electives  
4 credit hours of Chemistry or Math Electives  
12 credit hours of General Electives

**Pre-Medical Track (42 credit hours)**

CH 214 Organic Chemistry II  
BIO 434 Biochemistry I  
SOC 103 Principles of Sociology  
PHL 313 Ethics  
4 credit hours of Biology Electives  
4 credit hours of Chemistry or Math Electives  
8 credit hours of General Electives

**Choose one of the following physiology classes (4 credit hours):**

BIO 304 Plant Biology  
BIO 384 Human Anatomy & Physiology I

**Choose one of the following natural science classes (4 credit hours):**

BIO 214 Conservation  
BIO 334 Environmental Biology  
BIO 284 Aquatic Biology

**Choose one of the following organism classes (4 credit hours):**

BIO 304 Plant Biology  
BIO 314 Animal Biology  
BIO 324 Microbiology

**TOTAL IN DEGREE PROGRAM:**

**120 HRS**



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

	Mathematics	Science	Hum/SS	Communication	Other
<b>General Education</b> 43 hours	MA 134 MA 164 MA 213 MA 253 or MA 393	PH 224/224H PH 234/234H	ENG 153 HUM Elect (3)  PSY 113/113H SOC SCI Elect (3)	ENG 103  ENG 113 <i>or</i> ENG 133  SP 203 <i>or</i> COM 163	
<b>Program Requirements</b> 77 hours	<p><b>Chemistry Core (49 credit hours)</b>            UE 101 University Experience            CH 104 General Chemistry I            CH 114 General Chemistry II            CH 202 Introduction to Chemical Literature &amp; Communication            CH 204 Organic Chemistry I            CH 214 Organic Chemistry II            CH 234 Quantitative Chemical Analysis            CH 302 Professional Practice in Science            CH 324 Chemical Instrumental Analysis &amp; Laboratory            CH 344 Inorganic Chemistry            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 I            CH 444 Biochemistry II</p> <p><b>Choose one of the following 3 tracks in addition to the Chemistry Core:</b>  <u><b>Traditional Track (28 credit hours)</b></u>            24 credit hours of General Electives            SCI 412 Senior Research Seminar <i>and</i> SCI 422 Senior Research Project  <i>or</i>            SCI 434 Science Internship</p> <p><u><b>Physician Assistant Track (28 credit hours)</b></u>            BIO 114 Principles of Biology I            BIO 124 Principles of Biology II            BIO 163 Medical Terminology            BIO 324 Microbiology            BIO 384 Human Anatomy &amp; Physiology I            BIO 394 Human Anatomy &amp; Physiology II            SCI 434 Science Internship            1 credit hour General Elective</p> <p><u><b>Pre-Medical Track (28 credit hours)</b></u>            BIO 114 Principles of Biology I            BIO 124 Principles of Biology II            SOC 103 Principles of Sociology            PHL 313 Ethics            SCI 434 Science Internship            10 credit hours General Electives</p>				
<b>TOTAL IN DEGREE PROGRAM:</b>					<b>120 HRS</b>

**BACHELOR OF SCIENCE-FORENSIC SCIENCE MAJOR**

**120 HRS**

	Mathematics	Science	Hum/SS	Communication	Other
<b>General Education 44 hours</b>	MA 134 MA 253	CH 104 CH 114 CH 204 BIO 114	ENG 153 HUM Elect (3)  PSY 113/113H SOC SCI Elect (3)	ENG 103  ENG 113 <i>or</i> ENG 133  SP 203 <i>or</i> COM 163	
<b>Content Requirements 77 hours</b>	<p><b><u>Forensic Science Core (36 credit hours)</u></b>                      UE 101 University Experience                      CH 214 Organic Chemistry II                      CH 234 Quantitative Chemical Analysis                      CH 324 Chemical Instrumental Analysis &amp; Laboratory                      CH 434 Biochemistry I                      FS 203 Principles of Forensic Science I                      FS 223 Principles of Forensic Science II                      FS 351 Criminalistics &amp; Crime Scene Laboratory                      FS 373 Forensic Comparative Science                      FS 422 Expert Testimony in Forensic Science                      LE 273 Criminal Procedures &amp; Evidence                      SCI 434 Science Internship</p> <p><b>Choose one of the following 2 concentrations in addition to the Forensic Science Core:</b></p> <p><b><u>Biology Concentration (40 credit hours)</u></b>                      PH 154 College Physics I                      PH 164 College Physics II                      BIO 154 Basic Human Anatomy &amp; Physiology                      BIO 202 Introduction to Biological Literature &amp; Communication                      BIO 302 Professional Practice in Science                      BIO 324 Microbiology                      BIO 343 Cell Biology                      BIO 374 Forensic Biology                      BIO 414 Genetics                      BIO 443 Pathology                      BIO 454 Molecular Biology                      2 credit hours of General Electives</p>				

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**Chemistry Concentration (40 credit hours)**

MA 164 Calculus II  
MA 213 Calculus III  
PH 224 University Physics I  
PH 234 University Physics II  
CH 202 Introduction to Chemical Literature & Communication  
CH 302 Professional Practice in Science  
CH 344 Inorganic Chemistry  
CH 351 Physical Chemistry I Lab  
CH 353 Physical Chemistry I  
CH 364 Toxicology  
CH 444 Biochemistry II  
CH 474 Forensic Chemistry  
1 credit hour of General Electives

Students interested in the Pre-Medical track would need to take the appropriate additional coursework which would include BIO 124 (for those student in the chemistry concentration), SOC 103 and PHL 313. This would result in earning more than the 120 hours prescribed for the forensic science degree.

**TOTAL IN DEGREE PROGRAM:**

**120 HRS.**

## **COLLEGE OF GRADUATE AND 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**

CGPS students are encouraged to participate in activities at their respective education centers, but may also participate in main campus activities. Students who qualify are eligible for memberships in various scholastic honoraries, such as those in business or criminal justice. Students may use student ID cards to attend main campus events.

### **LIBRARY**

All CGPS students have the opportunity to use the main campus Library and Information Services, either in person or on the Web. Multiple resources are available to all students online through the library at *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 coursework offered by the military as recommended by the American Council on Education in its Guide to the Evaluation of Educational Experiences in the Armed Services. Credits are awarded subject to the approval of the Office of the Registrar.

## DEGREE PROGRAMS

Trine University's College of Graduate and Professional Studies academic degrees include:

### GRADUATE DEGREE PROGRAMS

- MASTER OF BUSINESS ADMINISTRATION
- MASTER OF SCIENCE IN ENGINEERING MANAGEMENT
- MASTER OF SCIENCE IN INFORMATION STUDIES
- MASTER OF SCIENCE WITH A MAJOR IN CRIMINAL JUSTICE
- LOU HOLTZ MASTER OF SCIENCE IN ORGANIZATIONAL LEADERSHIP

## CGPS UNDERGRADUATE DEGREE PROGRAMS

### ASSOCIATE DEGREE PROGRAMS

- ASSOCIATE IN ACCOUNTING
- ASSOCIATE IN BUSINESS ADMINISTRATION
- ASSOCIATE IN CRIMINAL JUSTICE
- ASSOCIATE OF SCIENCE IN INFORMATION SYSTEMS
- ASSOCIATE OF SCIENCE IN MANUFACTURING TECHNOLOGY

BACHELOR OF ARTS WITH A MAJOR IN COMMUNICATION

BACHELOR OF SCIENCE WITH A MAJOR IN INFORMATION SYSTEMS

BACHELOR OF SCIENCE WITH A MAJOR IN CRIMINAL JUSTICE

BACHELOR OF SCIENCE WITH A MAJOR IN PSYCHOLOGY

BACHELOR OF SCIENCE IN HEALTHCARE ADMINISTRATION

BACHELOR OF SCIENCE IN MANUFACTURING TECHNOLOGY

BACHELOR OF SCIENCE IN ORGANIZATIONAL LEADERSHIP

BACHELOR OF SCIENCE IN BUSINESS ADMINISTRATION

#### MAJORS IN:

- ACCOUNTING
- APPLIED MANAGEMENT
- HUMAN RESOURCE MANAGEMENT
- INTERNATIONAL BUSINESS (Global Partnership Only)
- MANAGEMENT

**College of Graduate and 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.

## ASSOCIATE IN ACCOUNTING

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 in Business Administration degree with an accounting major.

### CGPS - ASSOCIATE IN ACCOUNTING

**60 HRS.**

	Mathematics	Science	Hum/SS	Communication	Other
<b>General Education</b> 22 hours	MA 113  Math or	Science elect (3)  Science (1)	HUM Elect (3)  ECO 213 or ECO 223	ENG 103 ENG 113	SP 203
<b>Additional Requirements</b> 8 hours	BA 101/UE 101 University Experience (Main Campus students) Or UE 111 Online Learning Orientation (CGPS students)  BA 201 Professional Development & Strategies  <i>Select two of the following courses (6 hrs)</i> BA 113 Business Applications COM 213 Business Communication PSY 113 Psychology				
<b>Program Requirements</b> 30 hours	<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 IN ACCOUNTING

**60 HRS.**

**CGPS - ASSOCIATE IN BUSINESS ADMINISTRATION 60 HRS.**

	Mathematics	Science	Hum/SS	Communication	Other
<b>General Education</b> 22 hours	MA 113  Math or	Science Elect (3)  Science (1)	ECO 213 or ECO223 HUM Elect (3)	ENG 103 ENG 113	SP 203
<b>Additional Requirements</b> 8 hours	BA 102/UE 101 University Experience (Main Campus students) Or UE 111 Adult Learning Orientation (CGPS students)  BA 201 Professional Development & Strategies  <i>Select two of the following courses (6 hrs.)</i> BA 113 Business Applications COM 213 Business Communication PSY 113 Psychology				
<b>Program Requirements</b> 30 hours	<p><b><u>Business Core (15 hrs.)</u></b>                      AC 203 Accounting I                      AC 213 Accounting II                      BA 123 Business Concepts                      LAW 203 Business Law I                      MK 203 Marketing</p> <p><b><u>Business Concentration (15 hrs.)</u></b>                      MGT 363 Organizational Behavior                      Electives (12 hrs.) - (prefixed AC, BA, ECO, ENT, FIN, LAW, LDR, MGT, and MK)</p>				

**ASSOCIATE IN BUSINESS ADMINISTRATION 60 HRS.**

**CGPS - ASSOCIATE IN CRIMINAL JUSTICE**

**60 HRS.**

	Mathematics	Science	Hum/SS	Communication	Other
<b>General Education 21 hours</b>	Math Elect (3)	Science Elect (3)	SOC 103 HUM Elect (3)	ENG 103  ENG 113 or ENG 133	Gen Ed Elect (3)
<b>Additional Requirements 15 hours</b>					UE 111 Electives (14)
<b>Content Requirements 24 hours</b>	LE 103 Introduction to Criminal Justice LE 153 Juvenile Justice LE 253 Probation, Parole & Community Corrections LE 263 Introduction to Criminal Law & Justice LE 273 Criminal Procedures & Evidence LE 343 Criminalistics & Crime Scene Investigations I PSY 113 Principles of Psychology PSY 383 Forensic Psychology				

**TOTAL IN DEGREE PROGRAM:**

**60 HRS.**



**CGPS - ASSOCIATE OF SCIENCE IN INFORMATION SYSTEMS 60 HRS.**

	Mathematics	Science	Hum/SS	Communication	Other
General Education 22 hours	MA 113	Science Elect (3)	SOC SCI Elect (3) HUM Elect (3)	ENG 103  ENG 133	BA 113  Gen Ed Elect (1)
Additional Requirements 14 hours	UE 111 Online Learning Orientation  Electives (13)				
Content Requirements 24 hours	BA 123 Business Concepts CSIT 103 Introduction to Information Systems CSIT 123 IT Infrastructure Basics INF 153 Python INF 263 Data Management INF 383 Data Visualization CSIT 223 Network Management COM 243 Digital Media Creation				

**TOTAL IN DEGREE PROGRAM:**

**60 HRS.**

**CGPS - ASSOCIATE OF SCIENCE IN MANUFACTURING TECHNOLOGY 60 HRS.**

	Mathematics	Science	Hum/SS	Communication	Other
General Education 22 hours	MA 113	PH 154	ECO 203 HUM Elect (3)	ENG 103  ENG 133	MA 123
Additional Requirements 14 hours	BA 201 Professional Development & Strategies UE 111 Online Learning Orientation MA 253 Statistics Electives (9)				
Content Requirements 24 hours	ETD 103 Basic Technical Drawing ETD 113 Geometric Dimensioning & Tolerancing ETD 163 Environmental Health & Safety ETD 173 Computer Aided 3-D Modeling with SolidWorks ETD 273 Electrical Fundamentals MT 113 Manufacturing Processes & Materials MT 253 Basic Dimensional Metrology ME 403 Quality Assurance for Manufacturing Technology				

**TOTAL IN DEGREE PROGRAM:**

**60 HRS.**

**CGPS - BACHELOR OF SCIENCE INFORMATION SYSTEMS MAJOR 120 HRS.**

	Mathe matics	Science	Hum/SS	Communication	Other
General Education 42 hours	MA 113 MA 253	SCI Elect (3)	PSY 113 PHL 313 SOC SCI Elect (3) HUM Elect (3)	ENG 103 ENG 133  SP 203	MA 323 BA 113 Gen Ed Elect (6)
Content Requirements 39 hours	BA 123 Business Concepts COM 243 Digital Media Creation COM 343 Web Content Management CSIT 103 Introduction to Information Systems CSIT 123 IT Infrastructure Basics CSIT 223 Network Management INF 153 Python INF 263 Data Management INF 343 Network Security INF 393 Data Visualization INF 403 Advanced Data Base IS 483 Information Systems Capstone Proposal (PENDING) IS 493 Information Systems Capstone Project (PENDING)				
Management/ Leadership Requirement 15 hours	MGT 383 Principles of Project Management  Complete 12 credit hours of 300-400 level MGT or LDR electives				
Additional 24 hours	UE 111  <u>Unrestricted Electives: 23 hours</u> Any college-level courses				

**TOTAL IN DEGREE PROGRAM:**

**120 HRS.**

**CGPS - BACHELOR OF ARTS—COMMUNICATION MAJOR 120 HRS.**

	Mathematics	Science	Hum/SS	Communication	Other
<b>General Education</b> 42 hours	Math Elect (3)  Math or Science Elect (3)	Science Elect (3)	FLM 203 Literature course (3) PSY 113 SOC SCI Elect (3)	ENG 103 ENG 113  SP 203	COM 123 COM 163 COM 203 General Ed Elect (3)
<b>Other</b> 15 hours	UE 101 Free Electives (14)				
<b>Students choose one of the following professional preparation tracks</b>					
<b>COM +</b> 15 hours	<b>COM+ Healthcare Administration</b> <i>primarily online</i> HC 313 (pending) HC 323 (pending) HC 413 PHL 353 (pending) MK 403 (pending)		<b>COM+ Leadership</b> <i>primarily online</i> LDR 103 LDR 203 LDR 303 LDR 333 LDR 403		<b>COM+ Information Systems</b> <i>primarily online</i> CSIT 103 CSIT 123 CSIT 223 INF 343 INF 263
	<b>COM+ Criminal Justice</b> LE 103 LE 153 LE 253 LE 263 LE 273		<b>COM+ Sports</b> <i>Angola campus only</i> EXS 103 EXS 123 EXS 203 EXS 221 EXS 483		<b>COM+ Environment*</b> <i>Angola campus only</i> Choose 15 hours: BIO 124/124L BIO 222 BIO 214/214L BIO 334/334L EAS 213 CE 3101 CE 3103** CE 4113
	<b>COM+ Strategic Focus</b> Choose at least 15 hours in consultation with your COM major advisor. These courses must be approved by the HAC department chair to ensure they meet professional track requirements.				

Trine University

<b>Content Requirements</b> <b>48 hours</b>	COM 111 Communication Practices & Professions COM 153 Principles of Public Relations COM 183 Writing for Media COM 213 Business Communication COM 233 Intercultural Communication COM 243 Digital Media Creation COM 253 Event Planning & Promotion COM 263 Communication Theories & Research COM 293 Argumentation & Debate COM 301 Media Practicum <b>(taken twice) (2)</b> COM 343 Web Content Management COM 353 Public Relations Writing & Production COM 363 Rhetoric & Persuasion COM 383 Advanced Writing for the Media COM 433 Media Law & Ethics COM 453 Public Relations Planning & Campaigns  COM 4013 Senior Capstone Internship <b>or</b> COM 4281 Senior Communication Proposal <b>and</b> COM 4292 Senior Communication Project
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\*COM+Environment may require pre-requisites. Students should consult with their advisor.

\*\*The pre-requisite of CH 114 is waived for COM+Environment students

**TOTAL IN DEGREE PROGRAM:**

**120 HRS.**

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**CGPS - BACHELOR OF SCIENCE – CRIMINAL JUSTICE MAJOR 120 HRS.**

	Mathematics	Science	Hum/SS	Communication	Other
<b>General Education</b> 42 hours	Math Elect (3)  Math or	BIO 1003  Science Elect (3)	HUM Elect (6)  HIS 103 <b>and</b> HIS 113 <i>Or</i> HIS 203 <b>and</b> HIS 213	ENG 103 ENG 113  SP 203 <i>or</i> COM 163	POLS 113 PSY 113 SOC 103
<b>Content Requirements</b> 63 hours	<p>UE 101 University Experience LE 103 Introduction to Criminal Justice LE 153 Juvenile Justice LE 253 Probation, Parole, &amp; Community Corrections LE 263 Introduction to Criminal Law &amp; Justice LE 273 Criminal Procedures &amp; Evidence LE 343 Criminalistics &amp; Crime Scene Investigations I POLS 333 State &amp; Local Government POLS 403 American Constitutional Development PSY 383 Forensic Psychology</p> <p>LE 433 Criminal Justice Capstone Demonstration <i>Or</i> LE 473 Law Enforcement Internship I</p> <p><b><u>32 Hours Free Electives</u></b> Electives are determined in conjunction with an advisor and based on student career objectives.</p>				
<b>Concentrations</b> 15 hours	<p><b>Select one of the following concentrations. (15 Hours)</b> <b><u>Option A – Law Enforcement</u></b> LE 313 Police Administration LE 353 Criminalistics &amp; Crime Scene Investigations II LE 423 Criminal Justice Agency Administration PSY 443 Advance Forensic Psychology SOC 323 The Family <b><u>Option B – Forensic/Correctional Psychology</u></b> LE 363 Institutional Corrections &amp; Correctional Law PSY 323 Abnormal Psychology PSY 413 The Psychology of Addiction PSY 423 Counseling Theories &amp; Practices PSY 443 Advanced Forensic Psychology <b><u>Option C – Agency Administration</u></b> LE 313 Police Administration LE 363 Institutional Corrections &amp; Corrections Law LE 423 Criminal Justice Agency Administration MGT 313 HR Management MGT 363 Organizational Behavior <b><u>Option D – Addictions</u></b> PSY 363 Counseling PSY 413 The Psychology of Addiction PSY 433 Issues of Substance Abuse in Family Systems PSY 483 Counseling Issues in Substance Abuse PSY 493 Issues &amp; Ethics in Psychology &amp; Counseling <b><u>Option E – Academy Training/Professional Training</u></b> Can be filled by documented Academy, Fire, Police, EMT or Military Training and/or Prior Learning.</p>				

**TOTAL IN DEGREE PROGRAM:**

**120 HRS.**

**CGPS- BACHELOR OF SCIENCE – PSYCHOLOGY MAJOR**

**120 HRS.**

	Mathematics	Science	Hum/SS	Communication	Other
<b>General Education</b> 42 hours	MA Elect (3)	BIO 1003  MA or SCI Elec (3)	HUM Elect (3) HUM Elect (3)  SOC SCI Elect (3) POLS 113	ENG 103 ENG 113  SP 203 <i>or</i> COM 163	PSY 113 Gen Ed Elect (3)  HIS 103 <i>and</i> HIS 113 <b>or</b> HIS 203 <i>and</i> HIS 213
<b>Additional I</b> 36 hours	UE 101  <u><b>35 Hours Free Electives</b></u> Students wishing to pursue graduate training in psychology should take: MA 113 College Algebra and MA 253 Statistics within these electives.				
<b>Content Requirements</b> 42 hours	<u><b>Required Core (6 hours)</b></u> PSY 303 Research Methods in Psychology <b>and</b> PSY 453 Clinical Internship <b>Or</b> PSY 473 Psychology Capstone Demonstration  <u><b>Subject Area Concentrations (18 hours)</b></u> <b>Choose three of the following clinical core courses (9 hours):</b> PSY 323 Abnormal Psychology PSY 363 Human Behavior & Counseling PSY 403 Human Sexuality PSY 413 The Psychology of Addiction PSY 423 Counseling Theories & Practices  <b>Choose two of the following social/cognitive core courses (6 hours):</b> PSY 333 Psychology of Personality PSY 343 Social Psychology PSY 373 Political Psychology  <b>Choose one of the following developmental core courses:</b> PSY 223 Lifespan Developmental Psychology PSY 353 Child & Adolescent Psychology SOC 323 The Family  <u><b>Additional Psychology Core Electives (18 hours)</b></u> <b>Choose 18 hours from any above subject area courses not used or from the list below.</b> PSY 313 Topics in Psychology PSY 383 Forensic Psychology PSY 433 Issues of Substance Abuse in Family Systems PSY 443 Advance Forensic Psychology PSY 483 Counseling Issues in Substance Abuse PSY 493 Issues & Ethics in Psychology & Counseling SOC 313 Topics in Sociology SOC 343 Social Psychology (Same as PSY 343) SM 393 Sport Psychology				

**TOTAL IN DEGREE PROGRAM:**

**120 HRS.**

**CGPS- BACHELOR OF SCIENCE IN  
HEALTHCARE ADMINISTRATION MAJOR**

**120 HRS.**

	Mathematics	Science	Hum/SS	Communication	Other
<b>General Education</b> 42 hours	MA 113 MA 253	BIO 163	ECO 343 (Pending) COM 233 PHL 353 (Pending) PSY 113	ENG 103 ENG 113  SP 203 <i>or</i> COM 163	BA 213 COM 213 Gen Ed Elect (6)
<b>Additional</b> 33 hours	UE 111 Online Learning Orientation BA 201 Professional Development & Strategies CSIT 103 or Computer Literacy <b>Electives: 28 hours</b>				
<b>Content Requirements</b> 45 hours	<p><b>Required Core (30 hours)</b>                      CSIT 123 Infrastructure Basics                      HC 303 US &amp; World Healthcare Systems (Pending)                      HC 313 Effective Management of Professional Relationships in Medicine (Pending)                      HC 323 Technology &amp; the Future of Medicine (Pending)                      HC 363 Healthcare Information Strategies (Pending)                      HC 413 Healthcare Finance &amp; Revenue Cycle Management                      HC 453 Patient Expectations &amp; Clinical Quality (Pending)                      HC 483 Healthcare Administration Capstone (Pending)                      HR 413 Human Resources Management in an Environment of Difficult/Scarce Resources (Pending)                      MK 403 Business Strategy &amp; Market Analysis (Pending)</p> <p><b>Subject Area Concentrations (15 hours)</b>  <b>Select one of the options below:</b>  <b>Option 1: Information Systems</b>                      CSIT 163 Using Programing to Solve Problems                      CSIT 223 Network Management                      CSIT 253 Artificial Intelligence &amp; Information                      INF 263 Data Management                      INF 343 Information Security</p> <p><b>Option 2: Organizational Leadership</b>                      LDR 103 Introduction to Organizational Leadership                      LDR 203 Leadership Strengths &amp; Skills                      LDR 333 Leadership Development &amp; Change                      LDR 343 Conflict Resolution                      LDR 403 Creativity, Innovation, &amp; Influence</p> <p><b>Option 3: Healthcare Specialty</b>                      Complete 15 credit hours of Healthcare Specialty courses</p> <p><b>Option 4: Communication</b>                      COM 153 Principles of Public Relations                      COM 243 Digital Media Creation                      COM 253 Event Planning &amp; Promotion                      COM 353 Public Relations Writing &amp; Production                      COM 413 Corporate &amp; Organizational Communication</p>				

**TOTAL IN DEGREE PROGRAM:**

**120 HRS.**



**CGPS - BACHELOR OF SCIENCE IN**

**MANUFACTURING TECHNOLOGY MAJOR**

**120 HRS.**

	Mathematics	Science	Hum/SS	Communication	Other
<b>General Education</b> 43 hours	MA 113 MA 123	PH 154	ECO 203 PSY 113 HUM Elect (3) HUM Elect (3)	ENG 103 ENG 133  SP 203	COM 213 CSIT 103 MA 253  Gen Ed Elect (3)
<b>Content Requirements</b> 42 hours	ETD 103 Basic Technical Drawing ETD 113 Geometric Dimensioning & Tolerancing ETD 163 Environmental Health & Safety ETD 173 Computer Aided 3D Modeling with SolidWorks ETD 273 Electrical Fundamentals MGT 323 Leadership MT 113 Manufacturing Processes & Materials MT 123 Introduction to AutoCAD Design MT 253 Basic Dimensional Metrology MT 313 Design for Manufacture & Assembly MT 323 Using SolidWorks to Generate Working Drawings MT 403 Quality Assurance for Manufacturing Technology MT 413 Manufacturing Technology Capstone Proposal MT 423 Manufacturing Technology Capstone Project				
<b>Concentration</b> 12 hours	<p><b>Select one of the options below:</b></p> <p><b><u>Option 1 - Management (online)</u></b>                      MGT 333 Supervision                      MGT 363 Organization Behavior                      MGT 373 Facility Management                      MGT 383 Principles of Project Management</p> <p><b><u>Option 2 - Manufacturing Technology Specialty</u></b>                      Complete 12 credit hours of MT Specialty courses</p> <p><b><u>Option 3 - Information Systems (online)</u></b>                      CSIT 123 IT Infrastructure Basics                      CSIT 223 Network Management                      INF 263 Data Management                      INF 343 Network Security</p>				
<b>Additional</b> 23 hours	BA 123 BA 201 UE 111 <b><u>Unrestricted Electives: 18 hours</u></b> Any college-level courses				

**TOTAL IN DEGREE PROGRAM:**

**120 HRS.**

**CGPS- BACHELOR OF SCIENCE IN  
ORGANIZATIONAL LEADERSHIP MAJOR**

**120 HRS.**

	Mathematics	Science	Hum/SS	Communication	Other
<b>General Education 42 hours</b>	MA 113	Science Elect (3)  MA or SC Elect (6)	ECO 203 PSY 113 PHL 313 HUM Elect (3)	ENG 103 ENG 113  SP 203	BA 213 COM 213 PSY 343
<b>Content Requirements 78 hours</b>	<p><b><u>Leadership Core (51 hrs.)</u></b>                      UE 111 Online Learning Orientation                      BA 123 Business Concepts                      BA 201 Professional Development &amp; Strategies                      BA 343 International Business                      LAW 203 Business Law                      LAW 403 Employment Law                      LDR 101 Organizational Leadership Philosophy                      LDR 103 Introduction to Organizational Leadership                      LDR 203 Leadership Strengths &amp; Skills                      LDR 313 Topics in Organizational Leadership                      LDR 333 Leadership Development &amp; Skills                      LDR 343 Conflict Resolution                      LDR 403 Creativity, Innovation, &amp; Influence                      LDR 453 Leadership Capstone                      MGT 313 Human Resource Management                      MGT 333 Supervision                      MGT 343 Human Resource Development                      MGT 363 Organization Behavior                      MGT 383 Principles of Project Management</p> <p><b><u>Additional Program Requirements (3 hrs.)</u></b>                      BA 113 Business Computer Applications</p> <p><b><u>Free Electives (24 hrs.)</u></b></p>				

**TOTAL IN DEGREE PROGRAM:**

**120 HRS.**

**CGPS BACHELOR OF SCIENCE IN BUSINESS ADMINISTRATION (BSBA)**

**ACCOUNTING MAJOR**

**120 HRS.**

	Mathematics	Science	Hum/SS	Communication	Other
<b>General Education</b> 42 hours	MA 113	Science Elect	ECO 213	ENG 103	PSY 113
	MA 173	(3)	ECO 223	ENG 113	BA 213
	MA 253		HUM Elect (3)	SP 203	COM 213
<b>Program Requirements</b> 78 hours	<b><u>Business Core (35 hrs.)</u></b>				
	UE 111 Online Learning Orientation AC 203 Accounting I AC 213 Accounting II BA 123 Business Concepts BA 201 Professional Development & Strategies 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 BA 3113 Business Internship or MGT 473 Capsim Business Simulation				
	<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 Advanced Managerial Finance Accounting or Finance Elective (300-400 level from AC or FIN) – 3 hrs. Accounting or Finance Elective (300-400 level from AC or FIN) – 3 hrs. Business Electives (300-400 level from AC, BA, ENT, FIN, HR, LAW, LDR, MGT, MK) – 3 hrs.				
	<b><u>Additional Program Requirements (3 hrs.)</u></b>				
	BA 113 Business Computer Applications				
	<b><u>Free Electives (7 hrs.)</u></b>				

**TOTAL IN DEGREE PROGRAM:**

**120 HRS.**

**BACHELOR OF SCIENCE IN BUSINESS ADMINISTRATION (BSBA)**

## Trine University

The business programs in the College of Graduate and Professional Studies at Trine University are accredited by the Accreditation Council for Business Schools and Programs (ACBSP), [www.acbsp.org](http://www.acbsp.org), for the following majors: Associate in Accounting, Associate in Business Administration, Applied Management, Human Resource Management, International Business (Global Partnership only), and Management.

### **APPLIED MANAGEMENT**

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

#### **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.

### **TECHNICAL SPECIALTY**

Students completing the Bachelor of Applied Management degree program must complete a minimum of 9 semester hours in technical field/concentration acquired through occupational, technical training or classroom instruction.

**CGPS BACHELOR OF SCIENCE IN BUSINESS ADMINISTRATION (BSBA)  
APPLIED MANAGEMENT MAJOR 120 HRS.**

	Mathematics	Science	Hum/SS	Communication	Other
<b>General Education 42 hours</b>	MA 113 MA 173 MA 253	Science Elect (3)	ECO 213 ECO 223  HUM Elect (3) HUM Elect (3)	ENG 103 ENG 113  SP 203	BA 213 PSY 113 COM 213
<b>Program Requirements 78 Hours</b>	<p><b><u>Business Core (35 hrs.)</u></b>                      UE 111 Online Learning Orientation                      AC 203 Accounting I                      AC 213 Accounting II                      BA 123 Business Concepts                      BA 201 Professional Development &amp; Strategies                      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                      BA 3113 Business Internship or MGT 473 Capsim Business Simulation</p> <p><b><u>Concentration Requirements (18 hrs.)</u></b>                      Business courses with approval of Advisor or Chair – Student must be transferring in all 9 hours of a technical field/concentration. If a student can't transfer in all 9 hours, it must be a field that can be completed at Trine such as Criminal Justice. If the student does not have 9 hours and it can't be completed at Trine, the transfer credits can't be accepted as an applied management concentration. They should be considered as a normal transfer evaluation.</p> <p>Business Electives -9hrs. (300-400 level MGT)</p> <p><b><u>Additional Program Requirements (3 hrs.)</u></b>                      BA 113 Business Computer Applications</p> <p><b><u>Free Electives (22 hrs.)</u></b></p>				

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

**CGPS BACHELOR OF SCIENCE IN BUSINESS ADMINISTRATION (BSBA)  
HUMAN RESOURCE MANAGEMENT 120 HRS.**

	Mathematic	Science	Hum/SS	Communication	Other
<b>General Education 42 hours</b>	MA 113 MA 173 MA 253	Science Elect (3)	ECO 213 ECO 223  HUM Elect (3) HUM Elect (3)	ENG 103 ENG 113  SP 203	PSY 113 BA 213 COM 213
<b>Program Requirements 78 hours</b>	<p><b><u>Business Core (35 Hrs.)</u></b>                      UE 111 Online Learning Orientation                      AC 203 Accounting I                      AC 213 Accounting II                      BA 123 Business Concepts                      BA 201 Professional Development &amp; Strategies                      BA 343 International Business                      FIN 303 Managerial Finance                      LAW 203 Business Law I                      MGT 353 Design Operations                      MGT 363 Organizational Behavior                      MGT 453 Strategic Management                      MK 203 Marketing                      BA 3113 Business Internship or MGT 473 Capsim Business Simulation</p> <p><b><u>Concentration Requirements (30 Hrs.)</u></b>                      FIN 403 Investments                      HR 303 Compensation &amp; Benefits                      HR 313 Training &amp; Development                      HR 323 Safety &amp; Health Management                      HR 403 Project Management                      LAW 403 Employment Law                      MGT 313 Human Resource Management                      MGT 323 Leadership                      PSY 363 Counseling                      Business Electives (300-400 level from AC, BA, ENT, FIN, HR, LAW, LDR, MGT, MK) – 6 hrs.</p> <p><b><u>Additional Program Requirements (3 hrs.)</u></b>                      BA 113 Business Computer Applications</p> <p><b><u>Free Electives (7 hrs.)</u></b></p>				

**TOTAL IN DEGREE PROGRAM:**

**120 HRS.**

**CGPS BACHELOR OF SCIENCE IN BUSINESS ADMINISTRATION (BSBA)  
INTERNATIONAL BUSINESS MAJOR 120 HRS.  
(Global Partnership Only)**

	Mathematics	Science	Hum/SS	Communication	Other
<b>General Education 42 hours</b>	MA 113 MA 173 MA 253	Science Elect (3)	ECO 213 ECO 223  HUM Elect (3) HUM Elect (3)	ENG 103 ENG 113  SP 203	PSY 113 BA 213 COM 213
<b>Program Requirements 78 hours</b>	<p><b><u>Business Core (35 Hrs.)</u></b>                      UE 111 Online Learning Orientation                      AC 203 Accounting I                      AC 213 Accounting II                      BA 123 Business Concepts                      BA 201 Professional Development &amp; Strategies                      BA 343 International Business                      FIN 303 Managerial Finance                      LAW 203 Business Law I                      MGT 353 Design Operations                      MGT 363 Organizational Behavior                      MGT 453 Strategic Management                      MK 203 Marketing                      BA 3113 Business Internship or MGT 473 Capsim Business Simulation</p> <p><b><u>Concentration Requirements (30 hrs.)</u></b>                      COM 233 Intercultural Communication                      ECO 383 International Economics                      ENT 303 Entrepreneurial Leadership                      FIN 323 Money &amp; Banking                      FIN 343 International Finance                      FIN 413 Advanced Managerial Finance                      LAW 413 International Law                      MK 343 International Marketing                      MK 353 The Global Consumer                      Business Electives (300-400 level from AC, BA, ENT, FIN, HR, LAW, LDR, MGT, MK) – 6 hrs.</p> <p><b><u>Additional Program Requirements (3 hrs.)</u></b>                      BA 113 Business Computer Applications</p> <p><b><u>Free Electives (7 hrs.)</u></b></p>				

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

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**CGPS BACHELOR OF SCIENCE IN BUSINESS ADMINISTRATION (BSBA)  
MANAGEMENT MAJOR 120 HRS.**

	Mathematics	Science	Hum/SS	Communication	Other
<b>General Education 42 hours</b>	MA 113 MA 173 MA 253	Science Elect (3)	ECO 213 ECO 223  HUM Elect (3) HUM Elect (3)	ENG 103 ENG 113  SP 203	PSY 113 BA 213 COM 213
<b>Program Requirements 78 hours</b>	<p><b><u>Business Core (35 hrs.)</u></b>                      UE 111 Online Learning Orientation                      AC 203 Accounting I                      AC 213 Accounting II                      BA 123 Business Concepts                      BA 201 Professional Development &amp; Strategies                      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                      BA 3113 Business Internship or MGT 473 Capsim Business Simulation</p> <p><b><u>Concentration Requirements (30 hrs.)</u></b>                      MGT 303 Risk Management                      MGT 313 Human Resource Management                      MGT 323 Leadership                      MGT 373 Facility Management                      MGT 383 Project Management                      MGT 413 Management of Quality                      Marketing Elective (300-400 level from MK) – 3 hrs.                      Management Elective (300-400 level from MGT) – 3 hrs.                      Management Elective (300-400 level from MGT) – 3hrs.                      Management Elective (300-400 level from MGT) – 3 hrs.                      Business Electives (300-400 level from AC, BA, ENT, FIN, HR, LAW, LDR, MGT, MK) – 3 hrs.</p> <p><b><u>Additional Program Requirements (3 hrs.)</u></b>                      BA 113 Business Computer Applications</p> <p><b><u>Free Electives (7 hrs.)</u></b></p>				

**TOTAL IN DEGREE PROGRAM: 120 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
CSIT	Computer Science & Information Technology
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
GER	German
GLY	Geology
GM	Golf Management
GS	General Studies
HC	Healthcare Management
HED	Higher Education

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HIS	History
HNR	Honors Seminar
HOS	Hospitality & Tourism
HPE	Health & Physical Education
HR	Human Resources
HS	Health Science
HUM	Humanities
INF	Informatics
IS	Information Studies
LAW	Law
LDR	Leadership
LE	Law Enforcement
MA	Mathematics
MAE	Mechanical & Aerospace Engineering
MGT	Management
MK	Marketing
MT	Manufacturing Technology
MUS	Music
PAS	Physician Assistant Studies
PET	Plastics Engineering Technology
PH	Physics
PHL	Philosophy
PL	Pre-Legal Studies
POLS	Political Science
PSY	Psychology
PTA	Physical Therapist Assistant
RA	Regulatory Affairs
RES	Research
SA	Study Abroad
SCI	Science
SI	Social Innovation
SM	Sport Management
SOC	Sociology
SP	Speech
SPN	Spanish
THE	Theatre
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
- Courses numbered 700: 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**

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 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: AC 213, BA 213**

**AC 383 VOLUNTEER INCOME TAX ASSISTANCE (VITA) I 3-0-3**

Students will be trained in tax preparation services and a supporting software program. Students will then prepare federal and state income tax returns for qualifying elderly and low-income individuals. The Volunteer Income Tax Assistance (VITA) program offers free tax help to low-income people, persons with disabilities and limited English speaking taxpayers who need assistance in preparing their own tax returns. Students will gain experience in providing income tax service to clients and in preparing actual returns. **Prerequisites: AC 423**

**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 & 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 483 VOLUNTEER INCOME TAX ASSISTANCE (VITA) II 3-0-3**

Students will be trained in tax preparation services and a supporting software program. Students will then prepare federal and state income tax returns for qualifying elderly and low-income individuals. The Volunteer Income Tax Assistance (VITA) program offers free tax help to low-income people, person with disabilities and limited English speaking taxpayers who need assistance in preparing their own tax returns. Students will gain experience in providing income

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tax service to clients and in preparing actual returns. Students will serve as supervisors of first-year students participating in the program. They will provide training, scheduling, problem resolution and auditing services. **Prerequisites: AC 383**

### **AC 493 SELECTED TOPICS IN ACCOUNTING 3-0-3**

This course treats specific or current accounting issues and problems in depth.

### **AC 533 CORPORATE TAXATION 3-0-3**

The course seeks to develop in participants an understanding and ability to assess corporate income tax issues. In particular, the focus will be on corporate formations, capital structure issues, dividends, stock redemptions and partial liquidations, complete liquidations, corporate divisions and reorganizations and S Corporation elections and related issues. **Prerequisite: Must be admitted to either the MBA or Certificate Program**

### **AC 553 FEDERAL TAXATION OF PASS-THROUGH ENTITIES 3-0-3**

The course seeks to develop in participants a broad understanding and ability to assess tax issues associated with partnerships and LLCs. The course will cover partnership formations, partner distributions, sales and liquidations of partnership interests, terminations, issues associated with accounts receivable and inventory and family limited partnerships.

**Prerequisite: Graduate Standing**

### **AC 5003 ADVANCED AUDITING 3-0-3**

Advanced Audit provides an in-depth analysis of current auditing issues, especially those involved in completing the audit: auditors' reporting responsibilities, internal control over reporting for public companies, the requirements of the Sarbanes-Oxley Act and auditing of information technology systems. In addition, the course focuses on compliance concepts and techniques, detailed attestation and review services, and the professional judgment process model for auditing financial statements. Recognized standards, such as the International Auditing Standards (IAS) and the Generally Accepted Government Auditing Standards (GAGAS), are discussed in detail. **Prerequisite: AC 463**

### **AC 5013 MANAGERIAL ACCOUNTING 3-0-3**

This course is an introduction and examination of essential accounting and finance principles, teaching students how to use accounting and financial information for effective decision making, planning, and controlling the operations of business enterprises. Significant emphasis is placed upon determining cost of products and pricing decisions. Other topics include break-even analysis and pricing, capital budgeting, cost-volume-profit analysis and operating budget analysis. **Prerequisite: Graduate Standing**

## **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**

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### **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 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 & 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 & 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.

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### **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.

## **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.

## 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.

## BIOLOGY

### **BIO 103 GENERAL BIOLOGY (NO LAB) 3-0-3**

An introduction to the basic principles of biology with an emphasis on: biological chemistry, cell biology, metabolism, genetics, diversity of organisms, evolution, and ecology. A background in high school chemistry is strongly recommended. Open to non-science majors only.

### **BIO 1003 PLANTS AND PEOPLE (NO LAB) 3-0-3**

An introduction to the basic principles of plant biology and the interrelationship between plants and humans with an emphasis on basic plant anatomy and physiology, economic and historical importance, and the roles of plants in the biosphere. Open to non-science majors only.

### **BIO 104/104L GENERAL BIOLOGY & LABORATORY 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 114/114L PRINCIPLES OF BIOLOGY I & LABORATORY 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 123 MICROBIOLOGY FOR THE SURGICAL TECHNOLOGIST 3-2-3**

This course prepares students to apply knowledge of microorganisms as they relate to the infection process and disease transmission in the health care setting. This includes the causes of disease and pathological conditions, the body's response mechanisms to diseases and wound healing, and the importance of protective measures.

**BIO 124/124L PRINCIPLES OF BIOLOGY II & LABORATORY 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 154/BIO 154L BASIC HUMAN ANATOMY AND PHYSIOLOGY & LABORATORY 3-2-4**

Human Anatomy and Physiology will explore the structure of the human body. The class and laboratory will cover the different systems that make up the body and how they work to maintain homeostasis including, the integumentary, skeleton, muscular, digestive, respiratory, endocrine, nervous and reproductive systems. The laboratory will cover the different systems and functions that are detailed in the lecture portion. Model identification and dissection will facilitate student learning. **Prerequisite: BIO 104 or BIO 114**

**BIO 163 MEDICAL TERMINOLOGY 3-0-3**

This course introduces building and utilizing a medical vocabulary through the use of prefixes, suffixes, word roots, and combining forms/vowels. Emphasis is placed on correct spelling, pronunciation, and knowing the correct definitions of many medical terms.

**BIO 202 INTRODUCTION TO BIOLOGICAL LITERATURE & COMMUNICATION 3-0-2**

A course focusing on the nature and use of biological literature and the communication of scientific knowledge. The student will gain experience in searching literature, properly citing and referencing sources, and writing a documented research paper. Oral Communication of their work will also be a component of this course.

**BIO 212 PHARMACOLOGY FOR SURGICAL TECHNOLOGIST (2 HRS.)**

This course examines the various types of drugs and familiarizes the student with the forms by which medications are administered, utilization of proper injection techniques, and preparation of parental and oral medications. The student is instructed in the proper use of the Physician's Desk Reference (PDR) and will work with it in classroom assignments.

**BIO 2X3 INTRODUCTION TO HEALTH & DISEASE (3 HRS.)**

The goal of this course is to establish a foundational understanding of human biology and biochemistry with an additional emphasis on the common tests and measures used as indicators of human health and disease. The course is not meant to serve as a comprehensive course in human structure and function for those interested in becoming health care professionals, but rather as a course providing a functional knowledge of the purpose of tests and measures for those planning to work within the health care industry (informatics, management, etc.). The course includes discussion of the basic cell and systems biology in the context of the human condition. Each foundational science section is followed by a discussion of the common tests and measures for each system and their implications for patient evaluation as well as determination of diagnoses and prognoses in clinical medicine.

**BIO 214/214L CONSERVATION & LABORATORY 3-2-4**

A study of biodiversity, including the negative impact of human society and what can be done to preserve it. Topics include measurement of biodiversity, ecosystem function, extinction, habitat destruction, fragmentation, degradation, over-exploitation, invasive species, climate change, conservation planning and priorities, fire, human interaction with the environment, human-

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modified landscapes and experimental design. Meets Ecology requirement for Biology majors. The lab focuses on communities and small populations by using GIS, GPS, computer modeling and the design, management and restoration practices of natural areas. Includes a variety of field trips to natural areas and implementation of hands-on management and restoration practices, including seed collection and processing, wildlife management and controlled burning.

**Prerequisite: BIO 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 274/274L GENERAL ECOLOGY & LABORATORY 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. 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 284/284L AQUATIC BIOLOGY & LABORATORY 3-2-4**

An introduction to organisms and processes in the aquatic environments, including function, biodiversity, and ecology of organisms. Topics include: the chemical and physical environment; the ecology of pelagic and benthic organisms, including those from lentic and lotic systems, benthic plants and phytoplankton; zooplankton; invertebrates, fishes; productivity and fisheries; freshwater pollution and conservation. The laboratory portion includes application of identification, sampling and analytical techniques to aquatic organisms and their habitats of local lakes and streams, and includes several required field trips. **Prerequisite: BIO 124**

### **BIO 302 PROFESSIONAL PRACTICE IN SCIENCE 2-0-2**

This course will provide students with the professional tools necessary to be successful in the fields of biology, chemistry, biochemistry, and forensic science. The course will help students construct an application packet (curriculum vitae and statement of purpose), give them experience researching relevant literature and presenting information in a professional setting, and learn about different areas of specialization of the faculty within the Department of Science. **Prerequisite: Junior Standing or Permission of the Chair**

### **BIO 304/304L PLANT BIOLOGY & LABORATORY 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 314/314L ANIMAL BIOLOGY & LABORATORY 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 324/324L MICROBIOLOGY & LABORATORY 3-2-4**

The isolation, growth, structure, function, heredity, and identification of microorganisms with emphasis on their relationship to humans. **Prerequisites: BIO 154 or CH 114**

**BIO 334/334L ENVIRONMENTAL BIOLOGY & LABORATORY 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 364/364L TOXICOLOGY & LABORATORY 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 374/374L FORENSIC BIOLOGY & LABORATORY 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 114 and CH 204; BIO 414 recommended**

**BIO 383 INTRODUCTION TO PHARMACOLOGY 3-2-3**

This introduction to pharmacology will focus on the study of drugs. This course will explain various therapeutic and adverse effects association with medications. It will cover several body systems and conditions affecting them, as well as the pharmacological treatment of them. Topics will include, muscle relaxants, anesthetics, pain medication. This course is to help individuals gain knowledge of how various medications affect the body. **Prerequisite: CH 114 or CH 155; BIO 394**

**BIO 384/384L HUMAN ANATOMY AND PHYSIOLOGY I & LABORATORY 3-2-4**

Develops a comprehensive understanding of the close inter-relationship between anatomy and physiology as seen in the human organism. Introduces students to the cell, which is the basic structural and functional unit of all organisms, and covers tissues, integument, skeleton,

muscular and nervous systems as an integrated unit. **Prerequisite: BIO 114 or BME 2013; CH 104**

**BIO 394/394L HUMAN ANATOMY AND PHYSIOLOGY II & LABORATORY 3-2-4**

Develops a comprehensive understanding of the close inter-relationship between anatomy and physiology as seen in the human organism. Continues the study of the inter-relationships of the systems of the human body. Introduces students to the study of the endocrine, cardiovascular, lymphatic, respiratory, digestive, urinary and reproductive systems. **Prerequisite: BIO 384**

**BIO 404/404L EMBRYOLOGY & LABORATORY 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 394**

**BIO 413 ENTOMOLOGY 2-2-3**

Integrated studies of the principal morphological, physiological, ecological and systematic relationships of insects. **Prerequisite: BIO 114**

**BIO 414/414L GENETICS & LABORATORY 4-0-4**

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; CH 204 Strongly Recommended**

**BIO 434/434L BIOCHEMISTRY I & LABORATORY 3-3-4**

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. **Prerequisites: CH 204 (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 444/444L BIOCHEMISTRY II & LABORATORY 3-3-4**

A second semester in Biochemistry would include topics in biosynthesis of the following: amino acids; purines and pyrimidines; proteins; nucleic acids. Topics in nitrogen metabolism and control of protein synthesis would also be discussed. Laboratories would supplement the lecture material. **Prerequisites: BIO 434 or CH 434 (Same as CH 444)**

**BIO 454/454L MOLECULAR BIOLOGY & LABORATORY 3-3-4**

This course is designed to provide a comprehensive overview of the key concepts in molecular biology and their applications. It will cover structure and function of nucleic acids, chromosome

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structure, and regulation of gene expression, as well as biological techniques used in the area of molecular biology. Additional topics will include advances in genetic engineering, gene therapy, protein functions, and programmed cell death. **Prerequisites: BIO 414 or Permission of Instructor**

### **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 to various topics of biomedical engineering. Lecture focuses on the interrelationship between mathematics, natural sciences, and fundamentals biomedical engineering principles. **Prerequisites: CH 104 or CH 155/Corequisite: MA 134**

### **BME 3003 MUSCULOSKELETAL BIOMECHANICS 3-0-3**

This course provides an introduction to fundamental approaches used to analyze human movement from a mechanical perspective, including forward and inverse dynamics, and also examines the properties of various musculoskeletal tissues (e.g. muscle, bone cartilage). Students study the basic principles of two-and-three-dimensional kinematics, kinetics, electromyography, and musculoskeletal structure and function. Students also apply these concepts to quantitative movement analysis, with an emphasis on the mechanics of typical and pathologic gait. This course relies on a blend of traditional instruction and experiential learning techniques.

**Prerequisites: CH 104 or CH 155, ES 223, and "C" or better in BME 2013**

### **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 155, ES 233, and "C" or better in BME 2013**

### **BME 3202 BIOMEDICAL ENGINEERING LABORATORY TECHNIQUES 0-2-2**

Introduction to basic laboratory techniques used in the development of human diagnostics and therapeutics. Techniques will include those relevant to the fields of drug discovery and tissue engineering. **Prerequisites: CH 104; Corequisite: BME 2013**

### **BME 3212 BIOMEDICAL ENGINEERING RESEARCH TECHNIQUES 3-2-3**

Integration of laboratory techniques and research processes as related to the biomedical engineering field. **Prerequisites: BME 3202**

**BME 4003 ADVANCED TOPICS IN BIOMECHANICS 3-0-3**

A survey of advanced topics in biomechanics. Topics covered will include orthopedic biomechanics, soft tissue mechanics, injury mechanisms and rehabilitation. **Prerequisites: BME 3003**

**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 ENGINEERING MEASUREMENTS & INSTRUMENTATION 2-2-3**

Principles of design and analysis of electronic instrumentation for medical applications. Topics include frequency domain analysis, various electrodes and transducers for physiological measurement, and biopotential amplifiers. **Prerequisite: PH 234 and ECE 213/211**

**BME 4413/4413L BIOMEDICAL ENGINEERING MEASUREMENTS  
& INSTRUMENTATION II 2-2-3**

Continuation of principles of design and analysis of electronic instrumentation and measurement for medical applications. Topics include modalities for physiological measurement, biological signal acquisition and processing, medical imaging modalities and electrical safety. **Prerequisite: BME 4403**

**BME 4503 TISSUE ENGINEERING 3 Hrs.**

Study of cell-cell and cell-matrix interactions in the context of the function of normal and pathological tissues. Lab work introduces tissue culture techniques. Applications may include cell trafficking, cellular delivery of drugs, and regeneration of tissues. **Prerequisites: BME 3202**

**BME 4603 BIOFLUID MECHANICS 3-0-3**

Fundamentals of fluid mechanics as it relates to anatomy and physiology of the human body. Properties, characteristics, parameters, and governing equations of fluid flow in laminar and turbulent regimes. Detailed understanding of relationships involving the physiological modeling of biological flow. **Prerequisite: ES 313, MA 233**

**BME 4613 BIOLOGICAL MASS & ENERGY TRANSPORT 3-0-3**

Fundamentals of transport phenomena as it relates to anatomy and physiology of the human body. Concepts of conduction, convection, thermal properties of materials, mass diffusion and compartmental modeling. Detailed understanding of relationships involving the mathematical modeling of several 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 biomechanical

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engineering. Design project work will continue in BME 4863. **Prerequisite: BME 3103, BME 3212, BME 4403, and "C" or better in BME 4603**

### **BME 4863 BIOMEDICAL ENGINEERING DESIGN II 1-4-3**

Conclusion of biomechanical engineering design project. Preparation of a formal written design report and oral presentation of the design. Course must be taken the semester immediately following BME 4853. **Prerequisite: BME 4853**

### **BME 490X SPECIAL TOPICS IN BIOMEDICAL ENGINEERING (1-4 CREDIT HOURS)**

An elective course for biomedical engineering students to study special topics of interest. **Prerequisites: Permission from the Department Chair**

## **BUSINESS ADMINISTRATION**

### **BA 102 UNIVERSITY EXPERIENCE - BUSINESS STUDENTS 2-0-2**

This course offers resources for success in learning for students new to Trine University. This course will assist students in becoming more efficient learners, understanding self and others, and learning personal life skills. This course will present information about Trine University offices and services to familiarize students with resources and procedures. The course will introduce the student to fields of study and careers in business. Students will begin the career planning process.

### **BA 113 BUSINESS COMPUTER APPLICATIONS 3-0-3**

This course emphasizes predominant software packages in word processing, spreadsheets, presentation graphics, database management, and e-mail usage.

### **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 201 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. **Prerequisite: Sophomore standing**

### **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



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formulas, automation features, advanced data analysis, using charts to analyze and communicate business information.

### **BA 233 BUSINESS CAPSTONE DEMONSTRATION 3 CR**

This capstone course will provide students the opportunity to integrate and synthesize previous coursework in business. In addition, to the Capstone Demonstration Project, students will be required to take the Major Field Test for the associate in business degree program.

**Prerequisite: All required coursework in the Associate of Business Core**

### **BA 200X SELECTED TOPICS IN BUSINESS (1-3 CREDITS)**

Offered to treat specific or current business topics in depth.

### **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**

### **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 203, MK 203**

### **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: BA 123**

### **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: BA 123**

### **BA 403 BUSINESS & 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,

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consumer, and environmental concerns and their implication for business. **(same as ECO 453)**  
**Corequisite: MGT 363**

### **BA 423 ENTREPRENEURSHIP 3-0-**

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**

### **BA 400X INDEPENDENT RESEARCH IN BUSINESS VARIES (0-3 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. (Course may be taken up to 3 times for credit)

### **BA 410X EHINGER FELLOWS LEADERSHIP DEVELOPMENT (0-1 HRS.)**

The Ehinger Fellows Leadership Development course is a required component of membership in the Ehinger Fellows leader/mentor/ambassador program. Students will engage in experiential leadership, communication, and strategic planning learning activities, create and implement discipline-specific and university-wide events, and learn how to be effective mentors and models of the dedication and professionalism expected of successful Trine University students. (Course may be taken up to 4 times for credit.) **Prerequisite: Nomination and selection as an Ehinger Fellow**

### **BA 5000 INTRODUCTION TO MBA (0 HRS.)**

This course provides, the initial experience in a graduate program designed to prepare students with an introductory overview of accounting and finance practices. Students will complete undergraduate accounting and finance formulas, practices and activities to ensure that they adequately comprehend basic practices to begin the Master of Business Administration program. The student is expected to complete course related work prior to the start of the MBA program only if they have not completed a Business, Accounting, Finance or related field undergraduate degree. **Prerequisite: Graduate Standing**

### **BA 500X GRADUATE INDEPENDENT STUDY (VARIES 1-3 HRS.)**

This course is to be used when approved by Program Director, in rare circumstances for a student to earn either 1, 2 or 3 credits for an independent study of the subject matter in the program.

### **BA 5103 BUSINESS ETHICS (3 HRS.)**

This course will cover ethics in a systematic and comprehensive way. Students will analyze techniques of moral reasoning and the argumentation needed to analyze moral issues in business. They will raise basic questions about the morality of economic systems, especially the United State. Discuss corporate governance to workers' rights to legitimate computer use. Human behavior and business consistency evolve, this course will mirror the ethical issues raised by those changes, most notably, information technology and the globalization of business. We will discuss the dimension of virtue, character, and caring; three concepts that have taken on increasing importance in recent years. Moral language must be used with care and caution when

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applied outside of the realm of human individuals and their actions. Special problems arise when considering the morality of corporations, nations and people – problems that concern the meaning of moral terms, and problems that must be faced and clarified if we are to be clear about our moral judgements in these areas.

### **BA 5223 EXECUTIVE COMMUNICATION (3 HRS.)**

This course will expose students to the fundamentals of business communication in multiple modalities, including those in the continually-evolving digital world. It will focus particularly on the needs of business audience (e.g. concision, document design, and the creation and delivery of professional presentation).

### **BA 6003 CPT INTERNSHIP (3 HRS.)**

The course involves the work experience related to the international students' field of study in a graduate program, to combine classroom theory with practical application through job-related experiences. The assignment and company must be approved by the Graduate Program Director. The areas of business attire, etiquette and protocol, ethics, human relations, and corporate culture will also be covered. This course is an optional course that students may take for further learning relating to their specified area of study in the graduate program and can only be taken in the initial semester.

### **BA 610X GRADUATE INDEPENDENT RESEARCH (VARIES 1-3 HRS.)**

Independent research is conducted under the supervision of a faculty member. This course provides the student with the opportunity to research a specific area of unique interest to them aligned with their educational objectives. A research paper or other significant deliverable is required.

### **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 & 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 MSOL 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**

**BA 6643 SUSTAINABILITY & 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**

**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**

**BA 6933 STATISTICS & 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

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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.**

### **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, project management, human resource issues and other topics germane to understanding management information systems. **Prerequisites: Business Administration Concentration content courses.**

### **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. Students must complete this course last in the MSOL Program**

### **BA 6000Z GRADUATE INTERNSHIP (.5 HRS)**

The initial experience in a graduate program designed to combine classroom theory with practical application through job-related experiences. Students are actively employed in business, industry, government, and a variety of organizations and agencies with a work focus which relates to their graduate academic training and career objectives. The student is expected to complete course related work for each semester registered in the course. **Prerequisite: Graduate Standing**

## **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 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 or CH 155;**  
**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**

### **CHE 222 SUSTAINABILITY & 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; Prerequisite: 252**

### **CHE 252 INTRODUCTION TO STATISTICAL & 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**

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: ENG 133, CHE 222, 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**

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### **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 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 453CHE 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 463/463L CHEMICAL PROCESS DYNAMICS & CONTROL 2-3-3**

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 coursework. Comprehensive projects that incorporate appropriate engineering standards and multiple realistic constraints. **Prerequisites: CHE 453, CHE 473, and ES 382**

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### **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 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: CHE 222 or BME 3202 (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 or BME 4603**

### **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 204**

### **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 or BME 4603**

## **CHEMISTRY**

### **CH 103 GENERAL CHEMISTRY I (NO LAB) 3-0-3**

Fundamentals of chemistry with emphasis on atomic structure, stoichiometry, thermochemistry, properties of solutions, properties of matter. Non-laboratory science. **Prerequisite: MA 113**



**CH 104/104L GENERAL CHEMISTRY I & LABORATORY 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/104L HONORS GENERAL CHEMISTRY I & LABORATORY 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 lectures will be kept to a minimum. Topics include, but are not limited to, atomic structure, stoichiometry, thermochemistry, properties of solution, and properties of matter. **Prerequisite: MA 113 and admission into the Honors Program, or permission of the instructor.**

**CH 114/114L GENERAL CHEMISTRY II & LABORATORY 3-3-4**

A continuation of CH 104. Emphasis is on chemical equilibria, thermodynamics, kinetics, acid-base reactions, electrochemistry, and properties of solutions. Includes laboratory time.

**Prerequisite: A 'C' or better in CH 104; Corequisite: CH 114L**

**CH 114H/114L HONORS GENERAL CHEMISTRY II & LABORATORY 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 144/144L CHEMISTRY — IDEAS & APPLICATIONS & LABORATORY 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/155L HONORS ADVANCED GENERAL CHEMISTRY & LABORATORY 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 202 INTRODUCTION TO CHEMICAL LITERATURE & COMMUNICATION 3-0-2**

A course focusing on the nature and use of biological literature and the communication of scientific knowledge. The student will gain experience in searching literature, properly citing and referencing sources, and writing a documented research paper. Oral Communication of their work will also be a component of this course.

**CH 204/204L ORGANIC CHEMISTRY I & LABORATORY 4-3-3**

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. This course also contains a laboratory portion where synthesis and experiments illustrative of the

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methods used in working with organic compounds are performed. Students must successfully complete both the lab and lecture portions to pass the course. **Prerequisite: CH 114**

### **CH 214/214L ORGANIC CHEMISTRY II & LABORATORY 4-3-3**

A continuation of CH 204 with a study in a similar manner of aromatic compounds. This course also contains a laboratory portion illustrating the synthesis and reaction of aromatic compounds. Students must successfully complete both the lab and lecture portions to pass the course.

**Prerequisite: CH 204**

### **CH 234/234L QUANTITATIVE CHEMICAL ANALYSIS & LABORATORY 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 or CH 155**

### **CH 302 PROFESSIONAL PRACTICE IN SCIENCE 2-0-2**

This course will provide students with the professional tools necessary to be successful in the fields of biology, chemistry, biochemistry, and forensic science. The course will help students construct an application packet (curriculum vitae and statement of purpose), give them experience researching relevant literature and presenting information in a professional setting, and learn about different areas of specialization of the faculty within the Department of Science.

**Prerequisite: Junior Standing or Permission of the Chair**

### **CH 324/324L CHEMICAL INSTRUMENTAL ANALYSIS a7 LABORATORY 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 344/344L INORGANIC CHEMISTRY & LABORATORY 3-3-4**

Structure and bonding in main group and transition metal coordination compounds with an accompanying discussion of the electronic structure of the d-orbitals, group theory, and descriptive chemistry of the elements. The laboratory portion includes experiments examining the nature of bonding in transition metal complexes, the spectrochemical series, spectroscopic properties of coordination compounds, ligating ability of ligands, acid/base models, and catalysis.

**Prerequisite: CH 114 and CH 204**

### **CH 351 PHYSICAL CHEMISTRY I LABORATORY 0-3-1**

Laboratory experiments included in the areas studied in CH 353. **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 or CH 155H, 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 364/364L TOXICOLOGY & LABORATORY 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 434/434L BIOCHEMISTRY I & LABORATORY 3-3-4**

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. **Prerequisites: CH 204 (Same as BIO 434)**

**CH 444/444L BIOCHEMISTRY II & LABORATORY 3-3-4**

A second semester in Biochemistry would include topics in biosynthesis of the following: amino acids; purines and pyrimidines; proteins; nucleic acids. Topics in nitrogen metabolism and control of protein synthesis would also be discussed. Laboratories would supplement the lecture material. **Prerequisites: BIO 434 or CH 434 (Same as BIO 444)**

**CH 474/474L FORENSIC CHEMISTRY & LABORATORY 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 204, CH 211, and CH 234**

**CH 400X SPECIAL ASSIGNMENTS IN CHEMISTRY VARIES (1-6 HRS.)**

Directed readings, independent study, or research. **Prerequisite: Permission of the Department Chair**

## CHINESE

*NATIVE SPEAKERS OF CHINESE MAY NOT REGISTER FOR CHN 113*

### **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**

## 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 programming skills will also be introduced, allowing students to customize software to meet the unique needs of specific civil engineering problems. A wide variety of problem solving approaches will be highlighted throughout the class, including iteration, optimization, and database manipulation.

### **CE 1023 ENGINEERING MATH 3-0-3**

This course is required for all freshman civil engineering students. It provides an overview of important mathematical concepts that will be used repeatedly in the civil engineering program and introduces computer software that can assist in the application of these concepts to solve engineering problems. Topics include algebraic manipulation of expressions, algebraic solution of equations and systems of equations, trigonometry and analytic geometry, differentiation with applications, and integrals with applications. Basic programming skills will also be introduced, allowing students to apply software to meet the unique needs of specific civil engineering problems.

### **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. **Corequisite: MA 134, CE 2001**

### **CE 3101 ENVIRONMENTAL ENGINEERING LABORATORY 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 3-0-3**

Environmental issues associated with air pollution, water quality, water treatment, wastewater treatment, solid & hazardous waste, and radioactive waste will be discussed and evaluated. Impacts to groundwater and surface water resources will also be examined. Regulations pertaining to each pollution scenario will be stressed, along with mass balances, environmental chemistry, and biological principles needed to accurately discuss environmental impacts.

**Prerequisite: CH 114; Corequisite: CE 3101**

**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 I 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: CE 3503; Corequisite: CE 3523**

**CE 3523 STRUCTURAL DESIGN I 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: 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.

**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 3803 GEOLOGY FOR ENGINEERS 3-0-3**

An introduction to the field of geology. Study of minerals and rocks and their formation, as well as geologic structure. Other topics will include soils, running water, and groundwater. Plate tectonics, glaciers, volcanoes, erosion, weathering, and geologic hazards are also covered. The impact of geology on engineering projects will also be discussed.

**CE 3903 INTRODUCTION TO SITE DEVELOPMENT 3-0-3**

The purpose of this course is to provide students with an overview of the site development process, integrating multiple disciplines of civil engineering including water resources, transportation, environmental and construction. The course will also introduce students to the process of considering how regulatory, economical, and environmental factors effect site development. **Corequisite: At least 4 of the 7 junior level CE courses: CE 3103, CE 3203, CE 3303, CE 3503, CE 3603, CE 3703 or CE 3523**

**CE 4103 POLLUTION CONTROL TECHNOLOGIES 3-0-3**

Pollution control technologies will be investigated assessed, and designed for a wide variety of environmental applications, including air pollution control, solid and hazardous waste,

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alternative water and wastewater treatment. Contaminant fate (where does the pollutant go?) and transport (how does the pollutant get there?) will also be evaluated from the smokestack for gaseous contaminants and from leaking facilities for solid and hazardous wastes.

**Prerequisite: CE 3103**

### **CE 4113 ENVIRONMENTAL REMEDIATION 3-0-3**

Contaminated soil, sediment, and groundwater may represent significant health risks to people and the natural environment. Risk assessment will be used to assess these scenarios, incorporating site characterization data, contaminant fate (where does the pollution go?), contaminant transport (how does the pollutant get there?) and local hydrological data.

Environmental remediation technologies appropriate for organic and inorganic contaminants will then be investigated, assessed, and designed for a wide variety of site conditions.

**Prerequisite: CE 3103**

### **CE 4123 WATER & WASTEWATER TREATMENT 3-0-3**

Water treatment protects human health, while wastewater treatment protects human and environmental health. Both conventional water and wastewater treatment plants utilize similar unit operations and processes, where water treatment focuses on applied physics and chemistry and wastewater treatment relies upon physics and microbiology. Process fundamentals and unit operation design are the focus of this upper level course. **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: CE 3303**

### **CE 4333 DESIGN OF WATER DISTRIBUTION SYSTEMS & 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 4503 STRUCTURAL ANALYSIS II 3-0-3**

In this course, matrix based computer methods are employed to analyze both determinate and indeterminate structures, and an introduction to the finite element method is presented. Also, fundamental concepts in structural dynamics, including the free and forced response of single degree of freedom systems, are introduced. **Prerequisite: Grade of "C" or better in CE 3503**

### **CE 4523 STRUCTURAL DESIGN II 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 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 3523 or permission of the instructor**

**CE 4603 HIGHWAY GEOMETRIC DESIGN 3-0-3**

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 & 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 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 sub-base design, permeable pavement design, and rigid and flexible overlays. **Corequisite: 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 4911 CIVIL & ENVIRONMENTAL ENGINEERING DESIGN WORKSHOP 2-0-1**

The culminating capstone design experience for Civil Engineering majors showcases program outcomes. Students work as a team utilizing project management strategies to investigate, examine, and formulate design solutions for a civil or environmental engineering problem. Designs incorporate acquired classroom knowledge, out-of-class learning, and sustainability concepts to simulate a “real world” design experience. The first semester of this two semester course focuses on project selection and planning, data acquisition, and out of class learning.

**Prerequisites: At least 4 of the 7 junior level CE courses, CE 3103, CE 3203, CE 3303, CE 3503, CE 3603, CE 3703, or CE 3523**

**CE 4912 CIVIL & ENVIRONMENTAL ENGINEERING DESIGN SEMINAR 2-0-2**

Design and decision-making by practicing civil engineers must incorporate a wide variety of external constraints, including sustainability, engineering ethics, public policy, and impact on the global society. This course prepares students so they can investigate, evaluate, and incorporate each of these types of external constraints for civil and environmental engineering projects.

**Prerequisite: At least 4 of the 7 junior level CE courses, CE 3103, CE 3203, CE 3303, CE 3503, CE 3603, CE 3703, or CE 3523**

**CE 4913 CIVIL & ENVIRONMENTAL ENGINEERING DESIGN 0-4-3**

The culminating capstone design experience for Civil Engineering majors showcases program outcomes. Students work as a team utilizing project management strategies to investigate, examine, and formulate design solutions for a civil or environmental engineering problem. Designs incorporate acquired classroom knowledge, out-of-class learning, and sustainability concepts to simulate a “real world” design experience. A written report and a formal group presentation must effectively communicate design solutions to stakeholders and engineering professionals. **Prerequisite: CE 4911 (Must be taken in the term immediately prior to taking 4913)**

## COMMUNICATION

**COM 111 COMMUNICATION: PRACTICES & 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 HISTORY OF THE 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

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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**

### **COM 203 MEDIA & SOCIETY 3-0-3**

A systematic approach to mass media in terms of structure, functions and effects; includes such topics as meaning, perception, selectivity, ethics persuasion, subliminal seduction, violence and erotica, political socialization, learning, agenda-setting, and uses and gratifications.

**Prerequisite: ENG 103**

### **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: C or better in ENG 103**

### **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 & 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 COMMUNICATION RESEARCH 3-0-3**

Considers the nature of theory development and research in the field of communication, as well as applied research methods used in communication professions. Considers the nature and use of quantitative, qualitative, and hermeneutic research, both in developing and testing theories and in application by communication professionals in public relations, corporate communication, journalism, and the media.

**COM 293 ARGUMENTATION & DEBATE 3-0-3**

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 students debate to sharpen their skills.

**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 the Department Chair**

**COM 303 DIGITAL PHOTOGRAPHY 3-0-3**

Designed as an introduction to photography, this course examines the relationship and role of the photograph, the photographer, and the viewer through active class discussions, photographic assignments, and critiques. This class will cover the fundamentals of digital imaging including: basic camera functions, file types, file management, and digital editing. Students will produce a body of work by the end of class. **This is a more hands-on, laboratory class and, as such is not a humanities elective.**

**COM 343 WEB CONTENT MANAGEMENT 3-0-3**

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 & 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 & 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

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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 ADVANCED WRITING FOR THE MEDIA 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 & 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 & 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 & 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**

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### **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 3-0-3**

An internship including capstone requirements, such as submission of a proposal and of written and oral final reports, requiring a minimum of 100 hours of work.

**Prerequisites: Senior Communication major, 2.5 G.P.A.**

### **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.

## COMPUTER SCIENCE

### **CS 1113 INTRODUCTION TO OBJECT-ORIENTED PROGRAMMING 2-1-3**

An introduction to object-oriented programming. 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 applications; effectively use debugging techniques and IDE. **Corequisite: MA 113 or higher**

### **CS 1123 C++ & 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, or ECE 401 Special Topics – Python, with a grade of “C” or above**

### **CS 1303 INTRODUCTION TO THE WORLD WIDE WEB 3-0-3**

Introduction to computer science through the World Wide Web, focusing on the techniques of web-page creation.

### **CS 2103 ALGORITHM DESIGN & 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 OPERATING SYSTEMS 3-0-3**

Students learn the concepts and vocabulary of operating system software that manages processes, memory, device drivers, and a user interface, including secondary storage and network access. The successful students will be able to: identify and explain the software concepts that provide the standard abstractions upon which developers rely; design, implement, modify, and analyze the responsibilities of these complex software systems; explain the vulnerabilities produced by poorly designed security; compare analytically current operating systems, addressing the solutions chosen in different systems and explaining the tradeoffs made. **Prerequisites: CS 1123 and SE 233**

### **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. (Same as SE 353) **Prerequisite: CS 1123**

**CS 2613 ARTIFICIAL INTELLIGENCE & INFORMATION 3-0-3**

This course introduces the basic terms and issues of artificial intelligence. It describes knowledge representation and search methods, and learning systems like genetic algorithms and neural networks. The course describes information models and systems, database systems data modeling, and both relational databases and query languages. **Prerequisites: CS 1123**

**CS 3223 NETWORK ARCHITECTURE 3-0-3**

Topics include distributed algorithms interfacing and communication; multiprocessing architectures; LAN, WAN and ISO/OSI; concurrency; scheduling; real-time issues; fault-tolerance; system performance measurement; scripting. **Prerequisites: CS 2213**

**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 or ECE 401 Special Topics - Python**

**CS 3613 ARTIFICIAL INTELIGENCE 3-0-3**

Introduction to Software AI and machine learning. Students will analyze problems and develop programs showing mastery of knowledge representation, expert systems and formal reasoning; heuristic searches; adaption; pattern classification/recognition, and learning. They will be ready to explain genetic algorithm development, supervised and unsupervised learning, and Bayesian learning. **Prerequisite: CS 1113 and MA 134**

**CS 4013 COMPUTER GRAPHICS 3-0-3**

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 PROGRAMMING LANGUAGE DESIGN 3-0-3**

An introduction to the diversity of programming paradigms, and a deeper look at the core concepts of compilers. Students will develop working code in several language paradigms, including a functional language; discuss symbols, types, lexical, dynamic, and static scopes, storage duration, and namespace; read syntax grammar; explain and exploit continuation and closure; critique the choice of a paradigm (Object-oriented, functional, procedural, data, logic) for an application. It's helpful to have project experience before this course. **Prerequisites: CS 1123**

**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 3-0-3**

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**

## **COMPUTER SCIENCE & INFORMATION TECHNOLOGY**

### **CSIT 101 INTRODUCTION TO COMPUTER SCIENCE & INFORMATION TECHNOLOGY**

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.

### **CSIT 103 INTRODUCTION TO INFORMATION SYSTEMS**

An introduction to the concepts of Information Systems including history, terminology, principles, and use of computers in solutions in business, scientific and educational decision-making problems. The emphasis of the course is topics in human-computer interaction and human factors, collaborative technologies, ethics, privacy, and ownership of information and information sources, information representation, the information life cycles, and the transformation of data to information. The relationships to the other main areas of computing such as Information Technology, Computer Engineering, Software Engineering, and Computer Science are explored. Hands on assignments in Word Processing, Spreadsheet Analysis, Database, Presentation Graphics, and collaboration software.

### **CSIT 123 IT INFRASTRUCTURE BASICS**

This course focuses on the fundamental informatics technologies and their use in the company, business, or organization. Topics include design and development of Web and other applications, computer operating systems, distributed systems, data applications, data information analysis, e-commerce, multimedia technology, social implication of informatics, current and emerging technologies.

### **CSIT 153 INTRODUCTION TO OPERATING SYSTEMS**

This course is an introduction to computer operating systems, including their organization and functions of hardware components. Emphasis on system commands, operating system interface, system utilities, shell programming, file systems, and security. Concepts, such as, the graphical user interface, device drivers, memory management, processes, concurrency, scheduling, multitasking and multiprocessing will be covered. Labs include the installation, management, troubleshooting, and administration of Microsoft Windows and Linux-based operating systems.

### **CSIT 163 USING PROGRAMMING TO SOLVE PROGRAMS**

This course is an introduction to the fundamental concepts and techniques of computer programming. Students will learn to translate a real problem into a program description, and write and test a program to implement their description. The emphasis will be on developing a



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professional style using correct syntax; modular design; definition of data types; sequence, selection, and repetition control structures; arrays; classes; and simple file input/output (I/O).

**Prerequisite: MA 113**

### **CSIT 203 WEB SITE DESIGN**

This course focuses on web technologies, web-based systems, and web page design. Topics covered include Internet applications, web site development, multimedia technologies, vulnerabilities, web site publishing, and web site maintenance.

### **CSIT 223 NETWORK MANAGEMENT**

Introduction to network management, including concepts and theory of data communications, network design, network topologies, wiring standards, protocols, network management tools, and network management tasks. **Prerequisites: CSIT 123**

### **CSIT 233 DESIGNING DATA LINKS TO WEB APPLICATIONS**

This course focuses on web page construction, client and server-side scripting, database interaction, file systems, performance issues, and security concerns of web applications.

**Prerequisites: CSIT 203 and INF 403**

### **CSIT 243 MOBILE APPLICATION DEVELOPMENT**

This course covers mobile application development frameworks; architecture, design and engineering issues, techniques, methodologies for mobile application development. Students will be required to implement a mobile application on two separate platforms. **Prerequisites: CSIT 163 and CS 1113**

### **CSIT 253 ARTIFICIAL INTELLIGENCE & INFORMATION**

An introduction to the field of artificial intelligence: LISP language, search techniques, games, vision, representation of knowledge, inference and process of proving theorems, and natural language understanding. **Prerequisite: CSIT 163**

### **CSIT 273 ENTERPRISE ARCHITECTURE**

This course covers foundational aspects of both enterprise and architectural thinking, including the software to technology to solution architecture continuum, role of EA in business and IT alignment, architectural styles, and techniques for capturing and documenting architectures. Techniques for analyzing and reasoning about architecture are practiced in assignment in class.

**Prerequisite: CSIT 123**

### **CSIT 311X INTERNSHIP**

This course involves meaningful work experience related to the student's field of study or other functional areas of Information Technology at an approved company. The assignment must be approved by both the student's advisor and the department chair. A maximum of 3 credit hours may be granted for any one work session. **Prerequisite: CSIT major, and permission of the department chair**

### **CSIT 333 INTRODUCTION TO E-COMMERCE SITE DEVELOPMENT**

This course introduces the concepts and technologies used in electronic commerce. The course content includes the need for e-commerce, the technological challenges, the legal and regulatory

framework, technological challenges, organization and business barriers, and strategies for creating a successful e-commerce site. **Prerequisite: CSIT 233**

### **CSIT 403 APPLICATIONS OF CYBERSECURITY**

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. **Prerequisite: CSIT 153 and INF 343**

### **CSIT 443 ADVANCED CYBERSECURITY CONCEPTS**

This course examines the analysis, design, implementation, and management issues surrounding effective concepts of cybersecurity. Virus protection and conceptual and technological aspects of data security for computer and networks will be examined including firewalls, authentication, encryption, wireless security, security protocols, security policy development, digital forensics, and fraud protection. **Prerequisites: CSIT 403**

### **CSIT 483 SENIOR CAPSTONE I**

Capstone design projects selected from a wide variety of areas related to Computer Science and Information Technology. Develops system approach to design: preparation of specifications, scheduling, modeling, simulations, and technological, financial and environmental aspects. Multi-disciplinary teamwork is emphasized. Prototyping, testing and completion of the project are required. Presentation of results required. **Prerequisite: Senior Standing**

### **CSIT 493 SENIOR CAPSTONE II**

Multi-disciplinary team experience in engineering design, emphasizing realistic constraints such as safety, economic factors, reliability, aesthetics, ethics and societal impact. Projects will be supervised by Computer Science and Information Technology faculty. **Prerequisite: CSIT 483**

## **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**

## 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 & 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 & 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: ENG 501 and 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 & 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 & HUMAN RESOURCE MANAGEMENT (3 HRS.)**

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 & 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 & 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: CRJ 593 Must be taken in the final term of the MSCJ or Certificate Program, and may be taken with one other MSCJ course.**

## **DESIGN ENGINEERING TECHNOLOGY (*SEE ETD*)**

## **DOCTORATE OF PHYSICAL THERAPY**

**DPT 500X GRADUATE INDEPENDENT STUDY (VARIES 1-3 HRS.)**

This course is to be used when approved by Program Director, in rare circumstances for a student to earn either 1, 2 or 3 credits for an independent study of the subject matter in the program.

**DPT 5024 FOUNDATIONS OF MEDICAL ANATOMY**

Students will increase their knowledge of the primary developmental patterns and structural composition of the human form. In addition to an increase in their anatomical knowledge, students will learn to correlate anatomical form with clinical manifestations of dysfunction of the primary body systems such as, but not limited to, the musculoskeletal, cardiovascular,

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respiratory, and nervous systems. Genetic, molecular, histological, and embryological disorders which manifest themselves as anatomical dysfunction will also be discussed within the context of the course. While the course is designed to be an EXTENSION of material from an undergraduate anatomy course, this course would satisfy the pre-requisite anatomy requirement for the DPT program. **Prerequisite: Accepted into the Doctorate of Physical Therapy program.**

### **DPT 5034 FOUNDATIONS OF MEDICAL PHYSIOLOGY**

This course will include detailed study of the physiology of the neuromuscular, cardiovascular, respiratory, renal, endocrine, and gastrointestinal systems. Emphasis is placed on medical aspects of human physiology and how these conditions manifest themselves within the patient presentation of human disease. Students will use interactive computer modeling to simulate clinical scenarios and analyze normal and pathophysiological responses. The course, while designed to be an extension of knowledge from an undergraduate human physiology course for preparation for graduate level study, would meet pre-requisite requirements for physiology for graduate school application criteria. **Prerequisite: Accepted into the Doctorate of Physical Therapy program.**

### **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, employ clinical problem-solving, participate in reflective group discussions and assume professional roles in various clinical patient care settings. Students are expected to demonstrate skills and apply knowledge obtained from concurrent coursework.

**Prerequisite: Accepted into the Doctorate of Physical Therapy program.**

### **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

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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 1-4-3**

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 5361 OUTCOME ASSESSMENT 2-0-1**

This course explores approaches to the appraisal of health, functional outcomes, and the effectiveness of physical therapy interventions. Students study specific metrics utilized for outcomes assessment, and analyze common health and rehabilitation outcomes measures in terms of reliability, validity, clinical utility, and cost effectiveness. 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 5381 INTEGUMENTARY SYSTEM 2-0-1**

This course introduces the physical therapy management of patients with integumentary system pathology or impairments. Study of anatomy, physiology, and pathologies of the integumentary system provide a foundation for theoretical and practical applications of care. Students learn to examine and evaluate individuals with integumentary lesions of various etiologies and to use appropriate clinical decision-making and problem-solving strategies to determine and implement safe and effective plans of care. **Prerequisites: 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



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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 & 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 & 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 0-2-1**

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 2-3-3**

In this second of a two course series focusing on the neuromuscular system, students will be introduced to the management of pediatric patients with neurological and neuromuscular conditions and co-morbidities. Instruction occurs via lecture, discussion of case scenarios, and guided laboratory practice. Relevant neuropathology is studied with an emphasis on examination, evaluation, diagnosis, clinical decision-making, prognosis, intervention, standardized assessments and relevant outcome measures. The appropriate use of assistive technologies is also explored. **Prerequisites: DPT 6134 and satisfactory completion of all coursework in previous semesters**

**DPT 6242 CARDIOPULMONARY PT 1-2-2**

The focus of this course is the physical therapy management of individuals with adults with movement-related cardiovascular and pulmonary conditions including those with significant co-morbidities. Instruction occurs via lecture, discussion of case scenarios, and guided laboratory practice. The pathology of conditions frequently managed by physical therapists is introduced with an emphasis on examination, evaluation, diagnosis, clinical decision-making, prognosis, intervention, standardized assessments and relevant outcome measures. **Prerequisites: 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

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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 5361, DPT 6172, and satisfactory completion of all coursework in previous semesters**

### **DPT 6291 ANATOMY SEMINAR II 0-2-1**

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 FIRST FULL-TIME CLINICAL EDUCATION EXPERIENCE**

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 & 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 5361, 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**

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### **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 Rinker-Ross 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 TERMINAL FULL-TIME CLINICAL EDUCATION EXPERIENCE 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 TERMINAL FULL-TIME CLINICAL EDUCATION EXPERIENCE 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 TERMINAL FULL-TIME CLINICAL EDUCATION EXPERIENCE 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 2-0-2**

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

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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)

## ECONOMICS

### **ECO 203 SURVEY OF ECONOMICS 3-0-3**

This course aims to provide an overview of the relevant areas of economics. After developing basic economic principles, such as the rationality assumption, the marginal benefit and marginal cost framework, and demand and supply analysis, equal attention is devoted to the principles of microeconomics and macroeconomics. Areas of study include firm decisions under various market structures, the role of money, central bank, and interest rates in the economy, as well as differing views on how an economy grows. **Prerequisite: MA 113**

### **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. **Prerequisite: MA 113**

**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.

**Prerequisite: MA 113**

**ECO 323 MONEY & 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. **(Same as FIN 323)**

**Prerequisite: ECO 223 or ECO 203**

**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. **(Same as FIN 373)**

**Prerequisite: ECO 223 or ECO 203, MA 253**

**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 or ECO 203**

**ECO 453 BUSINESS & 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)**

**Corequisite: MGT 363**

**ECO 400X INDEPENDENT STUDIES IN ECONOMICS VARIES (1-4 HRS.)**

Credit earned through directed reading, independent study, and research or supervised field work. Maximum 4 hours credit.

**ECO 5033 MICRO & MACRO ECONOMIC DECISION MAKING (3 HRS.)**

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

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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 & 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**

**Information presented in this catalog is subject to change at any time depending on actions taken by the State of Indiana, Office of Educator Effectiveness and Licensing (IDOE/OEEL). 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 110 FRANKS SCHOOL OF EDUCATION LIVING LEARNING COMMUNITY 1-0-0**

This 0-credit course is for FSOE Living Learning Community (LLC) members. Students will be engaging in LLC-related activities, workshops, and learning experiences.

### **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. Clinical experience. **Prerequisite: strong interest in a teacher education major**

### **EDU 181 INTRODUCTION TO TEACHING STUDENTS WITH MILD EXCEPTIONAL NEEDS 1-1-1**

A study of the historical, philosophical, ethical, and legal foundations of American special education. Content includes current issues, state and federal policies, and the rights, roles, and responsibilities of all stakeholders regarding the education of students with mild exceptional needs. Clinical experience. **Prerequisites: EDU 111, EDU 211**

### **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. Clinical 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.

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### **EDU 222 EDUCATIONAL PSYCHOLOGY FOR ELEMENTARY 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. **Prerequisite: EDU 111**

### **EDU 232 EDUCATIONAL PSYCHOLOGY FOR MIDDLE & SECONDARY SCHOOL 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. Clinical experience. **Prerequisite: EDU 111**

### **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. Clinical experience in area schools.

### **EDU 252 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.

### **EDU 282 THE DEVELOPMENT OF STUDENTS WITH MILD EXCEPTIONAL NEEDS 2-1-2**

A study of the characteristics and needs of students with disabilities. Factors that affect the learning and development of students with mild exceptional needs are examined. Clinical experience. **Prerequisites: EDU 181, Admission to Professional Education Sequence**

### **EDU 301 INSTRUCTIONAL DESIGN 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. Clinical experience. **Corequisite: EDU 303**

### **EDU 303 INSTRUCTIONAL DESIGN 3-0-3**

A study of the problems, purposes, and responsibilities of teaching, including educational standards, deductive and inductive instructional strategies, assessment, needs of diverse learners, daily and long-range planning, classroom management, and parental involvement in the schools. **Corequisite: EDU 301, Admission to Professional Education Sequence**

### **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.) Clinical experience.



**EDU 322 CULTURALLY RESPONSIVE TEACHING 2-1-2**

A study of educational programs and practices in schools with multicultural populations and a focus on becoming a culturally responsive teacher. Clinical experience.

**EDU 331 READING IN THE CONTENT AREA PRACTICUM 0-5-1**

A supervised field-based experience at the secondary 9-12 level with an emphasis on applying reading strategies appropriate for the various subject matter disciplines. **Co-requisite: EDU 332**

**EDU 332 READING IN THE CONTENT AREA 3-0-2**

A study of content area reading at the middle and high school levels. An emphasis on comprehension, study skills, and reading strategies appropriate for the various subject matter disciplines. Open to secondary and all-grade majors only. **Prerequisite: EDU 301, EDU 303; Co-requisite: EDU 331**

**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: 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: EDU 301, EDU 303**

**EDU 362 CLASSROOM BEHAVIOR & ENVIRONMENT 2-0-2**

A study of how educators can manage the behavior of learners and organize classrooms to achieve positive outcomes. Clinical experience.

**EDU 372 TEACHING OF LITERACY (3-6) 2-0-2**

A study of scientifically based reading instruction used to positively impact growth of learners in grades 3-6. Areas of study include essential components of literacy assessment, instruction, intervention, extension, and ongoing progress monitoring that is developmentally appropriate for learners in grades 3-6. No clinical placement. **Prerequisite: EDU 303; Corequisite: EDU 445**

**EDU 382 BEHAVIORAL ANALYSIS OF STUDENTS WITH MILD EXCEPTIONAL NEEDS 2-1-2**

A study of positive behavioral interventions and supports for students with mild exceptional needs. Clinical experience. **Prerequisites: EDU 282**

**EDU 39X INDEPENDENT STUDY FOR FRANKS SCHOOL OF EDUCATION (1-3 credits)**

This 1-3 credit course analyzes selected topics in education. A summative project that synthesizes explored content and includes real life application will be developed and presented by the

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student. This independent study must be arranged by the FSOE advisor or faculty and approved by the Franks School of Education dean. **Prerequisite: Permission from the FSOE dean**

### **EDU 411 PRACTICUM IN TEACHING—MIDDLE 0-10-1**

A supervised field-based experience at the middle school (5-8) level, with an emphasis on effective teaching methods and the philosophy of education. **Prerequisites: EDU 422, Admission to Professional Education Sequence**

### **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: EDU 301, EDU 303**

### **EDU 422 MIDDLE SCHOOL METHODS 2-1-2**

A study of instruction and techniques for successful teaching of middle-level students. Emphasis on planning, application, team teaching, interdisciplinary teaching, interrelationship of subject matter. Clinical experience. **Prerequisite: EDU 412**

### **EDU 431 SECONDARY METHODS PRACTICUM 0-10-1**

A supervised field-based experience at the secondary (9-12) level, with an emphasis on effective teaching methods and the philosophy of education. Open to secondary and all-grade majors only. **Prerequisite: EDU 301, EDU 303, and content area approval**

### **EDU 441 TEACHING OF READING PRACTICUM 0-5-1**

An in-depth study of the responsibilities of teaching reading in an elementary setting. Clinical experience. Open to elementary majors only. **Corequisite: EDU 445**

### **EDU 442 SECONDARY METHODS 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. Clinical experience. **Corequisite: EDU 431**

### **EDU 445 TEACHING OF LITERACY (K-5) 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: EDU 301, EDU 303; 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. Clinical experience. **Prerequisite: EDU 301, EDU 303**

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### **EDU 454 METHODS OF TEACHING MATHEMATICS & 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. Clinical experience. **Prerequisite: EDU 301, EDU 303**

### **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: EDU 301, EDU 303**

### **EDU 463 EDUCATIONAL MEDIA & TECHNOLOGY 2-1-3**

A study of instructional media and technology used in K-12 settings. **Prerequisite: EDU 301, EDU 303**

### **EDU 464 METHODS OF TEACHING LANGUAGE ARTS & 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. Clinical experience. Open to elementary majors only. **Prerequisite: EDU 301, EDU 303**

### **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 16 full weeks according to subject matter and grade level of planned certification. **Prerequisites: senior status; 3.0 GPA in major, overall; Corequisite: EDU 482**

### **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: EDU 301, EDU 303**

### **EDU 482 STUDENT TEACHING SEMINAR 1-0-2**

Analysis, synthesis, and reflection based on the student teaching experience. **Prerequisites: senior standing; 3.0 GPA in major, overall; Corequisite: EDU 470**

### **EDU 483 INDIVIDUALIZED PLANNING & ASSESSMENT OF STUDENT WITH MILD EXCEPTIONAL NEEDS (3-0-3)**

A study of formal and informal assessments used in the field of special education. Examination includes the development, implementation, monitoring, and amending of individualized programs for students with mild exceptional needs. Clinical experience. **Prerequisites: EDU 382**

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### **EDU 484 METHODS OF TEACHING STUDENTS WITH MILD EXCEPTIONAL NEEDS (3-0-4)**

A study of methodologies, techniques, technology, materials, and curricular resources used in teaching students with mild exceptional needs. Experiences will include planning, managing, and modifying learning environments and applying strategies that develop students' curriculum, communication, and social skills. Clinical experience. **Prerequisites: EDU 483**

### **EDU 400X DIRECTED STUDIES IN EDUCATION (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**

### **EDU 4103 EDUCATION STUDIES INTERNSHIP 3-0-3**

This course provides senior-level education students with immersive capstone experience in a setting aligned to their career path. An application of theory and implementation of educational strategies are required. This internship must be arranged by the FSOE advisor or faculty and approved by the Franks School of Education dean. **Prerequisite: Senior-level Education Studies majors**

## **ELECTRICAL AND COMPUTER ENGINEERING**

### **ECE 112 PROTOTYPING & PROJECTS 1-0-2**

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. **Corequisite: MA 164**

### **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

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transistors to operate in different regions; design rectifiers, filters, multipliers, and clampers using pn junction diodes; design circuits using TINA simulation software; implement the design in proto board. **Corequisite: ECE 233**

### **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: ECE 261; 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. **Prerequisites: ECE 263 and CS 1113 or ECE 401 Special Topics - Python; 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 313; 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 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 & DESIGN 3-0-3**

Teaches the code development process to students who can use an object-oriented computer language. Students will: identify activities of software project engineering; write a formal requirements document; perform object-oriented analysis of client requirements; use UML class and sequence diagrams to support object-oriented design; apply some software design patterns; implement your designed software in a team supported by a version-control tool; use a professional caliber GUI library to advantage; and follow coding standard. **Prerequisite: CS 1123**

**ECE 40X SPECIAL TOPICS IN ECE (1-2 HRS.)**

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**

**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 433 POWER ELECTRONICS 3-0-3**

Building on Discrete Electronics, this course addresses the concerns that arise in the design of semiconductor circuits and devices due to larger voltages and currents. Students can explain and quantify the performance of three-phase AC to DC and DC to AC converters, the performance of four-quadrant DC to DC converters, and quantify the effect of harmonic-producing electronics loads on a radial power system. **Prerequisite: ECE 233**

**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**

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



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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 & 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 3051 JUNIOR-YEAR LABORATORY 0-2-1**

This course is intended to secure and to extend student knowledge of sophomore fundamentals by posing multi-week laboratory exercises in the Junior year that move beyond the lab exercises required of Sophomores. The course is divided into halves, one for a project that extends circuit analysis and/or discrete electronics, and the other for a project that extends digital and/or microcontroller systems. **Prerequisites: ECE 211, 231**

### **ECE 4001 CONTEMPORARY ISSUES FOR ENGINEERS 1-0-1**

This is a seminar-based weekly course covering global perspectives on business and engineering, and the effects and responsibilities of engineers in society. Students will: understand sustainability and diversity and develop a broader perspective necessary to understand the impact of engineering solutions in an environmental and societal context; understand the complex global economy. **Prerequisite: Senior standing**

### **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; incorporate appropriate engineering standards; identify economic, environmental, social, ethical, and safety implications of the design; demonstrate communication skills necessary for successful teamwork; write a formal report that documents the entire design-cycle, from

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; SE Majors: ECE 4002, CS 2103, CS 2503 or SE 353**

### **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**

## **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 & 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

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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. Also covered will be the concept of minimizing the occurrences and damages of recurring future events.

### **EM 303 NATURAL & 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 & 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.)**

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 & 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 & 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;

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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 coursework 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 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 & 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: CRJ 593 must**

be taken in the final term of the MSCJ or Certificate Program, and may be taken with one other MSCJ course

## ENGINEERING GRAPHICS

### **EGR 141 INTRODUCTION TO SPATIAL VISUALIZATION 1-0-1**

Through instruction and exercises spatial visualization skills will be developed in preparation for engineering coursework and/or advanced coursework. Students will learn how to visualize objects in 3D and communicate that same object on 2D medium by developing their spatial thinking.

### **EGR 143 ENGINEERING GRAPHICS 2-2-3**

Graphical communication for engineers using sketching and computer-aided drafting. The fundamentals of orthographic projection, isometric projection and descriptive geometry are taught. An introduction to three dimensional models using solid modeling computer software is also covered. Emphasis is placed on developing the skills needed for mechanical engineering design.

### **EGR 152 ENGINEERING GRAPHICS FOR CE 3-0-2**

Graphical communication by means of sketching and computer-aided drafting. Fundamentals of orthographic projection and descriptive geometry. This course stresses applications of graphic communications, both manually and through the use of CAD systems.

### **EGR 453 ADVANCED PARAMETRIC DESIGN 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**

## 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. **Corequisite: 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 164**

**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 zz7 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

### **ENG 101 ENGLISH COMPOSITION I LAB 0-0-1**

Student response to assigned readings in writing. **Corequisite: ENG 103**

### **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 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**

### **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**

### **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 1003 CRITICAL READING & WRITING 3-0-3**

Emphasizes student reading skills necessary to successfully participate in course discussion, do research, and understand assignment instructions and requirements. Students will also respond in writing to assigned readings. **Prerequisite: Completion of ESL program or permission from the Department Chair.**

### **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. **Prerequisite: ENG 103 or ENG 104**



**ENG 253 GLOBAL LITERATURE 3-0-3**

Surveys the breadth of the multiculturalism at the heart of global Anglophone literature and brings together an array of diverse voices and experiences to explore how difference and otherness are negotiated literarily. **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 & 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**

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**

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**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 & 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**

**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 & 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**

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 the 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 the 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 the Department Chair**

**ENG 501 RESEARCH & 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.

## **ENGLISH AS A SECOND LANGUAGE**

**ESL 0003 GRAMMAR LITERACY**

Students are introduced to singular and plural nouns, pronouns and possessive pronouns, prepositions of location, the imperative, demonstratives and articles, adjectives 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 course serves as an on-going assessment of ESL students' progress in their coursework as well as in their participation in campus and community activities. All ESL students must register

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for this class every semester until they finish the program. With the consultation of all the students' current instructors, the ESL administration 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. Additionally, ESL students will be required to actively participate in campus and community activities. This course may be taken multiple times, and the final grade for this course will be the average of all current ESL courses with the exiting test score and campus and community participation affecting the final grade.

### **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 0132 INTRODUCTION TO WRITING**

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 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 varies (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 0224 BEGINNING READING & WRITING**

Students focus on high-beginning/low-intermediate reading and writing skills. Students learn to identify main ideas and details in intermediate-level reading passages and then to write clear topic sentences and give appropriate supporting details for well-organized academic paragraphs. Students make inferences from longer reading passages and restate and paraphrase an author's main points. Students also learn to synthesize information taken from non-prose readings such as graphs, tables and maps. Out-of-class readings with book reports and individual presentations are also required.

**ESL 0232 BEGINNING WRITING**

Students practice beginning-writing skills which include pre-writing strategies, organization techniques, and how to choose appropriate topics for academic paragraphs. Students study basic structures of a paragraph such as topic 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 0240 ESL PRONUNCIATION LAB**

Students work one-on-one with instructor and /or use interactive software to improve pronunciation skills. This course may be taken multiple times and is graded on a Pass/Fail basis.

**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 0291 ACCULTURATION TO US CAMPUS LIFE**

Students learn how to communicate effectively with US instructors, fellow students and campus staff in culturally appropriate ways. They learn what is expected of them as university students and how to fulfill those expectations. Cultural topics are presented and discussed in an atmosphere of mutual respect. Students also learn about local laws, campus rules and policies, emergency preparedness and procedures, holiday traditions, and current events. This course may be taken multiple times.

**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 0324 INTERMEDIATE READING & WRITING**

Students focus on advance academic reading and writing skills in order to prepare for college-level reading and writing tasks. Students practice understanding new vocabulary in context, making inferences, constructing paragraphs and organizing various types of essays. Students practice using coherence devices, support techniques, and effective formatting. Students also learn how to use secondary sources and how to avoid plagiarism by citing those sources

correctly. Students read and discuss fiction and non-fiction works, write reviews and give formal presentations on the 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 0412 RESEARCH & DEBATE**

In this course, students will learn and practice the skills of research and debate, with a strong emphasis on critical thinking, logic, analysis, and research techniques. Students will learn how to defend opposing sides of social and moral issues, as well as write persuasive research essays with credible sources cited correctly to support their opinion. Students will also participate in the research process prior to completing debates and learn techniques of avoiding plagiarism.

### **ESL 0422 AVOIDING PLAGIARISM**

This course helps students avoid plagiarism by correctly using outside sources in an academically appropriate and ethical manner. Students learn what constitutes plagiarism and what instructors in US institutions expect when giving assignments that require using outside sources.

### **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 0424 ADVANCED READING & WRITING**

Students focus on college-level academic reading and writing skills. They hone their skills of using context to understand unfamiliar vocabulary and to make inferences; they improve their summarizing and paraphrasing skills; and they compose various types of well-organized essays while reviewing coherence devices, support techniques, effective formatting, and avoidance of plagiarism through appropriate citing of sources. Student also read and discuss fiction and non-fiction works, write reviews and give formal presentations on the readings.

### **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. **Prerequisite: ESL 0343 or Placement in course by ESL Director**

### **ESL 0452 UNIVERSITY CLASSROOM SKILLS**

Students develop effective time management and study skills with a focus on active listening to academic lectures and effective note-taking. They 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.



### **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.

### **ESL 0461 ESL MATH BRUSH-UP**

This class is intended to prepare ESL students to take the math placement test before matriculating from the ESL program. Students discuss basic math and pre-calculus concepts in English and discuss the grammar, vocabulary and meaning of typical word problems. This class will meet four days a week for ten weeks starting the second week of classes and ending the eleventh week of classes, after which, students will take the Trine University math placement test.

### **ESL 0472 ADVANCED ESL FOR BUSINESS MAJORS**

ESL students study important language skills needed for Business majors. Students practice listening and speaking about business concepts using appropriate vocabulary for discussions in the business community. Students practice using case studies and giving individual and group presentations to prepare them for classes toward their business majors.

### **ESL 0482 ADVANCED ESL FOR ENGINEERING MAJORS**

ESL students study important language skills needed for Engineering majors. Students practice listening and speaking about engineering concepts using appropriate vocabulary for discussions in the engineering departments. Students explore engineering career areas, take lab tours, discuss courses and teacher expectations to prepare them for classes in engineering. Students give presentations and work on group projects to prepare them for classes toward the engineering majors.

### **ESL 143 ESL CAPSTONE 1-0-3**

This course is for degree-seeking students who have received conditional admission and are enrolled full-time in advanced ESL courses. Students demonstrate their English language skills, their knowledge of US culture, and their ability to succeed in a rigorous academic environment by passing the advanced-level ESL classes and fulfilling the campus and community participation requirements of the ESL program. A passing grade of C+ or higher will grant students unconditional admission into their major. **Corequisite: Students must be enrolled full-time in Trine's level 4 ESL courses.**

## **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. **Corequisite: MGT 363**

**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: MGT 353**

**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**

**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: BA 123, MA 253**

**ENT 6403 FUNDAMENTALS OF FORESIGHT & 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 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 & 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 MSOL Program**

**ENT 7203 CREATIVITY & INNOVATION 3-0-3**

This course will allow students to develop techniques for improving the flexibility and originality of their thinking and will explore approaches used by leaders and organizations to create and sustain high levels of innovation. Topics include: personal thinking preferences, everyday creativity and eliminating mental blocks, creative thinking techniques, idea selection approaches, teaming techniques for creativity, conditions that promote creativity, design for interaction, disruptive technologies, and intellectual property.

**ENT 7213 BUSINESS PLAN CREATION 3-0-3**

This course will present some of the primary theoretical underpinnings of the field as well as some of the common and/or promising methodological approaches to the study of entrepreneurial phenomena and resulting business plan creation. Topics covered include: a theoretical overview of entrepreneurship, the origins of entrepreneurial opportunity, entrepreneurial attention and information processing, learning and knowledge related to opportunity, entrepreneurial decision making, entrepreneurial failure, role of entrepreneurs' human and social capital, and corporate entrepreneurship.

**ENT 7223 MARKETING & CONCEPT DEVELOPMENT 3-0-3**

This course will familiarize students with applications of relatively recent new product planning techniques. The course will emphasize the use of market research data and marketing models for new product development and management. The main topics to be covered in this course are idea generation, concept evaluation, optimal product design, test marketing, product positioning, market segmentation, market share estimation, product packaging, advertising testing, pricing, brand name selection, brand equity, and global product planning.

**ENT 7233 ORGANIZATIONAL STRATEGY AND DESIGN 3-0-3**

This course will develop an understanding of the basics of organizational design, how to utilize organizational design principles to manage change, and how to keep the design aligned with the needs of the firm and the demands to which it must response. The design and development effort includes study of organizational structures, the basic work patterns of the organization, organizational cultures, managerial roles, and the use of terms.

**ENT 7243 CONSULTING/COACHING PRINCIPLES 3-0-3**

This course will familiarize the students with a working understanding of the consulting role, client engagement process, solution development and presentation techniques and its applicability in a diverse client business environment for organizations.

## **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 & 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 & 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 3-0-3**

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 & 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: "C" or better in 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: "C" or better in 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, & 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 & 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 & DEVELOPMENT 3-0-3**

Introduction to product analysis, development and design. Conceptual design, design for manufacture, reverse engineering, concurrent engineering, designing for special needs, prototyping, and product safety. Integration of previous work into complete product design project. **Prerequisite: ETD 233**

**ETD 333 STATICS & 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 & 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**

The study of design principles and calculations of machine elements. To consideration of loads, stresses, and deformations as they relate to design is presented. Failure theories, mechanical material properties, and fatigue are also studied. **Prerequisite: ETD 243 or ETD 333, PH 154**

**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 the Department Chair.**

**ETD 423 SENIOR DESIGN PROJECT 3-0-3**

Study of advanced design methods a used in engineering design. A study of the design process as practiced the industrial setting. The procedures used from the start of a design until its final production including presentations and design reports. **Prerequisites: ETD 263, ETD 323**

**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 111 FRESHMAN PRACTICUM FOR EXERCISE SCIENCE 1-0-1**

A study in Health Science career options. Includes examination of responsibilities of physical therapist, physician assistant, sports performance coach or athletic trainer. Field Experience, Journal.

**EXS 123 TEACHING OF SPORT SKILLS II 3-0-3**

This class builds on what was taught in EXS 103. The purpose of this class is to give the student an understanding of the skills, rules, and strategies for a wide range of sports. The use of proper teaching progressions and techniques will be covered and the students will be asked to write lesson plans and demonstrate their ability to teach. **(Sport Management and Exercise Science majors/minors only.)**

**EXS 131 FIRST AID 1-1-1**

Classroom discussion and practical application of basic first aid principles. American Red Cross certification available.

**EXS 203 RISK & SPORTS 3-0-3**

This course examines terminology, legal aspects and risks associated with sports performance and physical activity.

**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 213 MOTOR CONTROL 3-0-3**

The study of how basic and applied knowledge of motor control underlies and enhances clinical, practical and research skills in those venues served by exercise scientists, physical educators and related health professionals.

**EXS 221 OFFICIATING 2-0-1**

The study of officiating, rules and regulations of sports.

**EXS 223 ESPORTS ANALYTICS 3-0-3**

This course focuses on the evaluation and interpretation of games and game footage to analyze matches, teams, players and the meta game of eSports. It will focus on how to interpret data between games, how to build teams for competitive leagues, and how to break down matches of current professional games. It will explore the different games, and different types of statistics between games analysts should focus upon.

**EXS 233 DRUG EDUCATION 3-0-3**

Examines the effects of alcohol, tobacco, and the “illicit” drugs on the physical, psychological, and social health of the individual. Performance-enhancing drugs are investigated.

**EXS 243 ATHLETIC TRAINING 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 253 ESPORTS ADMINISTRATION 3-0-3**

Students will explore the world of eSports through an administration perspective. Focus will be placed on the formation, structure, maintenance, and coaching of eSports organizations at the amateur, collegiate and professional levels.

**EXS 263 MOTOR LEARNING 3-1-3**

A study of the science of perceptual/motor learning including an understanding of the research in this area and application to the teaching of a variety of motor skills to people of different ability levels. The student should understand the problems that a learner faces in the acquisition of a variety of motor skills, develop a researched-based vocabulary, and have the ability to apply this knowledge by designing a teaching strategy that can assist the learner in this process.



**EXS 273 NUTRITION 3-0-3**

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 283 FITNESS EVALUATION ASSESSMENTS 3-2-3**

Examination of fitness and wellness assessment techniques. Students are expected to demonstrate competencies in a wide variety of testing and assessment procedures for analyzing fitness and wellness levels. Includes submax testing, blood pressure, body fat analysis, strength assessment, nutritional analysis, and individual exercise program development. American College of Sport Medicine protocol is utilized.

**EXS 293 BIOMECHANICS 3-0-3**

Understand the basic concepts of biomechanics, how they relate to the human body, and make connections between biomechanics and the sub disciplines of exercise science.

**EXS 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 343 PRINCIPLES OF HUMAN PERFORMANCE 3-2-3**

The purpose of this course is to explore the concepts of human performance and designing skill specific plyometric, agility and stability programs over a periodization cycle. **Prerequisite: Junior standing or permission of instructor**

**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 363 CAPSTONE EXPERIENCE IN EXERCISE SCIENCE I 3-1-3**

The purpose of this class is to prepare seniors in Exercise Science to complete their Capstone Experience successfully. It will introduce them to basic research and statistical concepts that can be used to help them develop and design their own original project and correctly analyze the resulting data. By the completion of the class, students will have designed and selected their basic research program and selected appropriate analysis tools to correctly determine the meaning of the results. **Prerequisite: Senior standing or permission of instructor**

**EXS 373 HEALTH PROMOTION & PROBLEMS 3-2-3**

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**

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 154 or BIO 384, EXS 243**

**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 154, EXS 243, EXS 353**

**EXS 413 CORRECTIVE EXERCISE 2-3-3**

The purpose of the corrective exercise class is to provide instruction and practice on inhibitory, lengthening, activation, and integration techniques. **Prerequisites: EXS 333**

**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 154, 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 154, EXS 243**

**EXS 453 CAPSTONE EXPERIENCE IN EXERCISE SCIENCE II 3-2-3**

The Capstone is a comprehensive final project, which demonstrates mastery of pedagogy and knowledge. Integration and synthesis of knowledge, skills, pedagogy, and concepts from the disciplines of physical education, exercise science, health education or sport management will be explored. Emphasis is placed on independent work and the development of a student project. **Prerequisite: Senior standing or permission of instructor**

## Trine University

### **EXS 471 ADANCED GLOBAL PERSPECTIVES HEALTH & 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 & 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: sophomore, junior, or senior standing with 2.5 GPA**

### **EXS 474 INTERNSHIP IN FITNESS & 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 PROFESSIONAL DEVELOPMENT IN EXERCISE SCIENCE (3 HRS.)**

Explore and evaluate careers with in the exercise science field. Students will be discussing the professional skill set, ethics and documentation within the setting through internship based learning experiences. Provides opportunity to interact with other allied health practitioners.

**Prerequisites: Advisor approval**

### **EXS 493 STRENGTH & CONDITIONING PREPARATION (3 HRS.)**

This class discusses how to apply the various energy systems and principles of exercise prescription, health programming and periodization to the strength and conditioning field. Proper technique with exercises and evaluation tools are incorporated to adequately prepare the student for a career in the strength and conditioning field and The Strength and Conditioning Specialist Certification Exam. **Prerequisite: Senior standing or permission of instructor**

### **EXS 300X TOPICS IN EXERCISE SCIENCE (1-4 HRS.)**

This course is designed to help students explore topics in the exercise science field.

## FILM

### **FLM 203 FILM APPRECIATION 3-0-3**

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.

## 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, MA 253, BA 213 or CSIT 103**

### **FIN 303H MANAGERIAL FINANCE (honors section) 3-0-3**

This course is an extended version of the basic managerial finance course. It is designed for honors students and students majoring in finance and accounting. In addition to studying basic principles of managerial finance including time value of money, capital budgeting, methods of financing, working capital management, financial statement analysis, student will also devote a substantial portion of the course to applying these concepts to real data using Excel.

**Prerequisites: AC 213, MA 253, BA 213 or CSIT 103**

### **FIN 323 MONEY & 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. **(Same as ECO 323) Prerequisite: ECO 223 or ECO 203**

### **FIN 343 INTERNATIONAL FINANCE 3-0-3**

This course involves a study of the topics essential to the understanding of international finance. Topics include foreign exchange markets and currency risk, international financial markets, international banking, trade financing, country risk analysis, accounting and taxation issues, capital budgeting, international lending, and borrowing techniques. **Prerequisite: ECO 223 OR ECO 203**

### **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 113**

**FIN 363 VENTURE FINANCING 3-0-3**

This course examines the venture financing options available for new business startups; emphasizes creating and analyzing financial documents, approaching financial sources, assessing the financing alternatives, selling stock for growing companies, the capital structure decision and managing the financial condition of a new venture. **Prerequisite: FIN 303**

**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. **(Same as ECO 373) Prerequisite: ECO 223 or ECO 203, MA 253**

**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 ADVANCED MANAGERIAL FINANCE 3-0-3**

An analytical approach to financial management of a corporation. Areas covered include: corporate governance, capital budgeting, cost of capital, long term financing, capital structure, dividend policy, working capital management and mergers. **Prerequisite: FIN 303**

**FIN 473 FINANCIAL MODELING 3-0-3**

Students learn how to build a realistic equity valuation model, utilizing software such 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**

**FIN 5063 CORPORATE FINANCE 3 HRS.**

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**

**FIN 5203 FINANCE FOR ENGINEERS 3 HRS.**

This course navigates students through the corporate environment of Capital and Operating Based Budgets, Cost Accounting, Economic and Business Cycles, TVM, Financial Statements and managerial decision making for Engineers. Students will gain a deep knowledge of the economic viability of engineering decisions and learn an appropriate balance between design alternatives, resulting costs, and their impact on enterprise. Students will learn applied measureable concepts to maximize efficiency and competitive advantage. **Prerequisite: Graduate standing**

**FIN 5823 FINANCIAL MODELING 3 HRS.**

In this course, students will build robust financial forecasts and models, learn tips and tools, analyze the results, and learn how to communicate key data to decision makers in your business organizations. Students will learn how to build the financial model, how to generate a financial forecast and ultimately how to drive business. Students will create more powerful and accurate forecasting models that enhance business decision making as used in investment banking and financial analysis. **Prerequisites: Graduate standing**

**FIN 5833 INTERNATIONAL FINANCE 3 HRS.**

This course will cover issues related to economies in the global environment, international financial markets, and international financial management. Throughout the course, students will learn the basic issues of the macro-economy and issues related to balance of payments between national economies. Additionally, the course focuses on the international financial markets, specifically the foreign exchange market, the international money markets, and the conditions that define their interrelation. Finally the course will consider issues associated with the operation of a firm in the global environment, including exchange rate risk management, international portfolio investing and international project evaluation and financing. Key corporate financial issues will be explored including exchange rate exposure, taxation, securities pricing, the cost of capital, and the evaluation of foreign projects.

**Prerequisites: Graduate standing**

**FIN 5843 FINANCIAL MARKETS & INSTITUTIONS 3 HRS.**

This course will provide students with an in depth view of investigation and analysis of organization, structure, and performance of U.S. money and capital markets, and institutions. Examines regulation of the financial industry and the role of financial instruments.

**Prerequisites: Graduate standing**

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### **FIN 5853 INVESTMENT ANALYSIS & PORTFOLIO 3 HRS.**

This course demands from students to learn and understand the mechanics of securities markets, types of available investments, and an introduction to determination of securities values. Problems of investment policy are approached through studies of portfolio selection methods and the valuation of special classes of assets.

### **FIN 6923 MANAGERIAL ACCOUNT & FINANCE 3 HRS**

This course is an introduction and examination of essential accounting and finance principle, teaching students how to use accounting and financial information for effective decision making, planning, and controlling the operations of business enterprises. Significant emphasis is placed on corporate finance, introducing financial markets and institutions, asset valuation, and the relationships between risk and return. Other topics include break-even analysis and pricing, product cost systems, capital budgeting, and cost-volume-profit analysis.

## **FITNESS**

### **FIT 1001 SPEED & AGILITY TRAINING 0-2-1**

Development of flexibility, quickness, agility, and overall athletic speed.

### **FIT 201X COACHING INTERNSHIP (1-3 HRS.)**

The course involves a meaningful work experience related to student's field of study or other functional areas of coaching in an approved program. The assignment and company must be approved by the Athletic Director. A maximum of 3 semester hours can be counted toward degree requirements, with a maximum of 3 credit hours for any one work session. **Prerequisite: SM 413**

### **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 2121 LEARN TO ICE SKATE 0-2-1**

This course is designed to help students learn to ice skate. The students will gain an understanding of skills and safety components in ice skating.

### **FIT 2131 GOLF/BOWLING 0-2-1**

Introduction to the proper etiquette and fundamentals of golf and bowling. Service fee will be added for course enrollment.

### **FIT 2151 SOCIAL BOARD GAMES 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 2171 PILATES 0-2-1**

Pilates workout for students designed to teach students the fundamental movement patterns and exercises associate with Pilates. This course will help build balance, strength, and coordination.

**FIT 2191 WRESTLING 0-2-1**

The objective of this activity class is to improve the student's knowledge of the skills and strategies of wrestling through a variety of drills and games.

**FIT 2221 GOLF I 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.

**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 2281 STRENGTH TRAINING FOR HOCKEY 0-2-1**

The course is designed to help students learn how to develop and participate in strength and conditioning programs for hockey.

**FIT 2331 INDOOR/OUTDOOR SOCCER 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 BALLROOM 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 2371 VOLLEYBALL 0-2-1**

The objective of this activity class is to improve the student's knowledge of the skills, rules and strategies of men's and women's volleyball through a variety of drills, games and tests.

**FIT 2381 BASKETBALL 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 2391 LEARN TO PLAY HOCKEY 0-2-1**

The course is designed to help students learn to play hockey. The students will gain an understanding of skills and rules related to hockey.

**FIT 2411 YOGA 0-2-1**

This course is designed to teach students the fundamental movement patterns and exercises associated with yoga. This course will help build balance, strength, and flexibility.

**FIT 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 the Department Chair**

## **FORENSIC PSYCHOLOGY**

**FPY 603 THEORY & PRACTICE OF FORENSIC PSYCHOLOGY (3 HRS.)**

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: 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: CRJ 593, 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**

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 the 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. **(Same course as INF 213 and LE 213) Prerequisite: ENG 113 or ENG 133, CSIT 103, INF 183**

**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 & 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 & 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 & 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)**

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### **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. **Prerequisite: Junior standing in Forensic Science or by permission of the Department Chair**

### **FS 383 FIRE, ARSON, & EXPLOSION INVESTIGATIONS 3-0-3**

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 the 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 the 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. *NATIVE SPEAKERS OF FRENCH MAY NOT REGISTER FOR FRN 113*

### **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**

## **GENERAL ENGINEERING**

### **GE X7X SPECIAL TOPICS IN ENGINEERING VARIES (1-3 HRS.) X-0-X**

This course will be offered on an as-needed basis, and the topics and credit hours will depend on the need.

### **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**

This course covers the two broad areas of professional practice. The first consists of topics pertinent to career aspects of the profession: job search activities, graduate school information, lifelong learning, professional registration, and the role of professional societies. The second area concerns the social responsibilities of the practicing professional engineer: professional ethics, the role of engineering in public policy, the need for knowledge of current affairs, and consideration of the impact of technology upon society. **Prerequisite: Junior standing in engineering**

### **GE 403 ENGINEERING PROJECT 3-0-3**

A design or capstone project, with industrial or real-world application, producing all necessary and appropriate documentation, and if applicable, models, and prototypes. The project should entail a minimum of 3 hours of work per week. The project must be pre-approved by the Dean for the College of Graduate and Professional Studies and/ or a PE certified faculty member from the school.

**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.**

**GE 5093 DESIGN THINKING 3HRS.**

This course will shape the principles and strategies of creative design and provide a path for students to identify and develop the creative potential required to transform how we identify and solve problems. Solutions for business and society are not merely the domain of creative types, the methods demonstrated within this curriculum will provide students the confidence and opportunity required to illustrate and implement the creative design solutions required for the future.

**GE 5103 PROJECT MANAGEMENT 3HRS.**

The course examines project management from the strategic and operational point of view. Project management principles and methodology are covered with special focus on planning, scheduling, controlling, and coordinating individual and group efforts. Project management tools such as the critical path and Gantt charts will be reviewed as well as methods for controlling the four most important elements of any project: scope, time, cost, and resources. The course will focus on project management in manufacturing and industrial settings.

**GE 5113 NEW PRODUCT DEVELOPMENT & INNOVATION STRATEGIES 3HRS.**

Market and technology driven innovation strategies to identify and evaluate opportunities for new products will be presented. Methodologies to rapidly develop and market new products meeting customer expectations, target cost, quality, and delivery time will be covered. Procedural details and benefits of implementing a multidiscipline gated product development process involving go-no-go decision at the beginning and the end of various phases including feasibility study, concept development, design, prototype development, validation, product launch and life-cycle management will be discussed.

**GE 5123 LEAN ENTERPRISE & TOTAL QUALITY MANUFACTURING 3HRS.**

This course will cover statistical Six-Sigma driven Lean Enterprise and Lean Manufacturing concepts to enhance manufacturing processes and product quality to achieve lowest Target Cost. Other synergetic methodologies to integrate world-class best practices of engineering and manufacturing leading to operational excellence through cross-functional team work and continuous improvements to achieve customer satisfaction and improved profitability will also be discussed. Real-world case studies and problem-solving exercises will be offered as needed to help reinforce the knowledge and concepts involved. **Prerequisite: Graduate standing**

**GE 5133 LEAN SIX SIGMA 3HRS.**

This course will cover statistical Six-Sigma driven Lean Enterprise methodologies to enhance organizational processes and customer defined value to achieve most efficient product cost. Other synergetic methodologies to integrate world-class best practices of engineering and manufacturing leading to operational excellence through cross-functional team work and

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continuous improvements to achieve customer satisfaction and improved profitability will also be discussed. Real-world case studies and problem-solving exercises will be offered as needed to help reinforce the knowledge and concepts involved.

**Prerequisite: Graduate standing**

### **GE 5143 MANUFACTURING SYSTEMS INTERGRATION 3 HRS.**

This course presents modern manufacturing integration with four areas of emphasis: manufacturing processes, design for manufacturing, equipment and control, systems. The course aligns the integration of engineering and management disciplines for determining manufacturing rate, cost, quality and flexibility. Topics include process physics, equipment design and automation/control, quality, design for manufacturing, industrial management, and systems design and operation. **Prerequisite: Graduate standing**

### **GE 5163 ENGINEERED QUALITY 3 HRS.**

This course offers a broad view of Quality Engineer foundations to reinforce management and leadership within the Quality Management System (QMS). The focus aligns process efficiency and total quality management to generate the highest customer value. Various topics are reviewed including: Cost of Quality (COQ), ISO, auditing guidelines, product and process design, material control, metrology, acceptance sampling, reliable Measurement Systems and Analysis (MSA), preventative/corrective actions, process control improvement tools and hazard identification. Students have the ability to utilize this coursework to apply for the Certified Quality Engineer Exam. **Prerequisite: Graduate standing**

## **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**

## **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**

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### **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 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 the 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)**

## **GERMAN**

### **GER 104 GERMAN I 4-0-4**

Introduction to the German language and culture. Pronunciation, conversation and basic grammar skills are stressed. No previous study of German is required.

### **GER 114 GERMAN II 4-0-4**

Continues conversation and grammar skills. Additional emphasis on reading and writing.

**Prerequisite: GER 104 or permission of the instructor**

### **GER 203 GERMAN III 3-0-3**

An intermediate German class with an emphasis on reading and writing skills and grammar review. Students read selected original literary texts by German authors and write short

paragraphs related to the texts. Conversational skills are also emphasized. **Prerequisite: GER 114 or permission of the instructor**

### **GER 213 GERMAN IV 3-0-3**

A continuation of German III with an emphasis on reading and writing skills and grammar review. The difficulty level of the reading selections increases in this course. **Prerequisite: GER 203 or permission of the instructor**

## **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**

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 & 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**

### **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: GM 203**



**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: GM 203**

**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: GM 203**

**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**

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**

**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 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 203**

**GM 462 SENIOR SEMINAR IN GOLF MANAGEMENT 2-0-2**

This course will provide students with a framework for using critical thinking skills to integrate concepts, theories, and methods of inquiry presented through general education and Golf Management studies. Through reading, exercises, self-assessments, presentations, and teamwork, students will learn more about meaningful career options, challenges they will face, and how to plan for advancement and success. **Prerequisite: GM 203, GM 303, GM 323**

**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.

**GOVERNMENT** (*See POLS – Political Science*)

**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 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.

**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**

**HEALTH SCIENCE**

**HS 104 ANATOMY & PHYSIOLOGY I FOR APPLIED SCIENCE MAJORS (4 HRS.)**

This course is designed to prepare students for a career in health sciences. In this first of a two-course series, students develop an understanding of the close inter-relationship between anatomy, physiology and pathology as seen in the human organism. It introduces students to the cell, which is the basic structural and functional unit of all organisms, and covers tissues, integument, skeleton, muscular and nervous systems as an integrated unit. **Prerequisite: Applied Science Major**

**HS 114 ANATOMY & PHYSIOLOGY II FOR APPLIED SCIENCE MAJORS (4 HRS.)**

This course is designed to prepare students for a career in health sciences. IN this second of a two-course series, students develop an understanding of the close inter-relationship between anatomy, physiology and pathology as seen in the human organism. This course examines endocrine, cardiovascular, respiratory, lymphatic and immune, gastrointestinal, urinary and reproductive systems. **Prerequisite: Applied Science Major**

## 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 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 & 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

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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 & 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 & 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 & 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 coursework in leadership with healthcare content through the creation and implementation of applied programming or secondary/archival research. **Prerequisites: All LDR Core (5000-level) Courses and LDR 6803, LDR 6823, LDR 6833, LDR 6843** Students must complete this course last in the MSOL Program.

## HIGHER EDUCATION

### **HED 6513 STUDENTS & 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 & 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 & 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 MSOL 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 course 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 263 INDIANA HISTORY 3-0-3**

History of Indiana with an emphasis on Indiana's growth and development and its place within U.S. history.

**HIS 273 TOPICS IN HISTORY 3-0-3**

In depth survey of a selected topic in history. The course changes each semester with the specific topic of study announced in the class schedule.

**HIS 283 THE HISTORY OF GAMING 3-0-3**

This course is designed to educate students about the history of video games, gaming and eSports. This will focus specifically on the development of what video games started as, and what they have evolved into. This will include not only the history of the games, themselves, but the companies, creators, and culture that helped to create the industry as it currently exists. This course will cover the history of the video game from the 1950s to the modern day industry.

**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. **(Same course as POLS 323) Prerequisite: POLS 113 or HIS 113**

**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. **(Same course as POLS 343) Prerequisite: POLS 113**

**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 POLS 113**

**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. **(Same course as POLS 363) Prerequisites: HIS 113**

**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. **(Same course as POLS 403) Prerequisites: POLS 113**

**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. **(Same course as POLS 423) 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 the Department Chair**

## 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.

## 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.

**Prerequisite: Hospitality and Tourism Management Majors Only**

### **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: MK 203**

### **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: HOS 103**



### **HOS 322 MEETING & 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”.

### **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: 21 years of age**

### **HOS 404/404L QUALITY FOOD PREPARATION & 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 skills by performing a variety of tasks in a cooperative environment as they produce a dining experience to the general public. **Prerequisite: Hospitality and Tourism Management Majors Only**

### **HOS 413 CASINO, SPA, & 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: BA 123**

### **HOS 423 SANITATION & HEALTH IN THE FOOD SERVICE, LODGING, & 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: Hospitality and Tourism Management Majors Only**

## **HUMAN RESOURCE MANAGEMENT**

### **HR 303 COMPENSATION & 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 & 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. **(Same course as MGT 343)**

**Prerequisite: MGT 313**

**HR 323 SAFETY & 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. **(Same course as ETD 163) Prerequisite:**

**MGT 313**

**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. **(Same course as MGT 383) 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: Graduate Standing**

**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 certification offered through the Society for Human Resource Management. **Prerequisites: All LDR Core (5000-level) courses OR admission to non-degree graduate certificate program**

**HR 5953 COMPENSATION & 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

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Human Resource Management theme, analyzing a contemporary HR issue. The topic will be selected by the students, so that they can integrate the linkages between the themes, areas, and disciplinary foci of study, and apply the analytical frameworks, professional writing, research, and leadership skills acquired during the program. **Prerequisites: All LDR Core (5000-level) Courses and LDR 5923, LDR 5933, LDR 5943 and LDR 5953. Students must complete this course last in the MSOL Program.**

## HUMANITIES

### **HUM 23X SPECIAL TOPICS IN LANGUAGE & HUMANITIES (1-3 HRS.)**

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 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 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 equivalent**

### **INF 153 INTRODUCTION TO PYTHON 3-0-3**

This course introduces computer programming using the Python programming language. Emphasis is placed on procedural programming, algorithm, design, and language constructs common to most high level languages. An introduction to Python classes and object oriented design is included. **Prerequisite: MA 113 or equivalent**

### **INF 163 STRUCTURED LOGIC & 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 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: CSIT 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. **(Same course as FS 213 and LE 213)**

**Prerequisite: ENG 113 or ENG 133, CSIT 103, INF 183**

**INF 263 DATA MANAGEMENT 3-0-3**

This course discusses the concepts, techniques, and tools necessary to develop applications using relational database management systems. Topics covered in this course include conceptual data modeling, design of database systems using entity relationship models, and normalization. Other concepts include file organization, database representation, descriptions, software reliability, security, integrity, relational databases, and query languages. **Prerequisites: CSIT 103**

**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 INFORMATION SECURITY 3-0-3**

Principles of information security, including concepts and theory of security policies, access control methods, site security, information security, system security, user security, application security, and managing security functions through cryptographic services, protocols, authentication, authorization, and access control technologies. **Prerequisite: CSIT 223**

**INF 373 COMPUTER ARCHITECTURE 3-0-3**

This course focuses on the organization and architecture of computer systems hardware; memory systems; storage devices; input/output devices; instruction set architectures; addressing modes; processor design and computer arithmetic. Students present PC-related topics.

**Prerequisite: CSIT 103**

**INF 383 PRINCIPLES OF HEALTH INFORMATICS 3-0-3**

This course offers an overview of the field of health informatics by providing students with fundamental knowledge of the concepts of health informatics and how technology can be used in the delivery of health care. **Prerequisite: CSIT 253**

**INF 393 DATA VISUALIZATION 3-0-3**

Introduction to data visualization including both the principles and techniques. Students will learn the value of visualization, specific techniques in information visualization and scientific visualization, and understand how to best leverage visualization methods. **Prerequisite: INF 263**

**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 the Department Chair.**

**INF 403 ADVANCED DATA MANAGEMENT 3-0-3**

This course includes advanced topics for relational and object oriented database, enhanced query tables, report features, macros, and Visual Basic applications, relational algebra including RAR modeling, and SQL applications development. **Prerequisite: INF 263 or 363**

**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 the 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**

**INF 433 DATA MINING & ADVANCED 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: CSIT 393**

**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 coursework to a significant project of their own definition. The project may be completed through group effort. The design of the course follows the goals for the capstone experience. Students define the information problem for themselves, determine what techniques to use for the information problem they identify, and integrate human-centered and technical dimensions of information systems. **Prerequisite: Senior Standing**

### **INF 503 ADVANCED DATABASE 3-0-3**

Advanced topics for relational and object oriented database, enhanced query, tables, report features, macros, and Visual Basic applications, relational algebra including RAR modeling. SQL informatics applications development. Students will conclude the course with a project developing a functioning, business database. **Prerequisite: Graduate student enrolled in the Information Systems Programs.**

### **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 the Department Chair.**

## **INFORMATION STUDIES**

### **IS 5103 OBJECT ORIENTED PROGRAMMING IN JAVA 3 HRS.**

Intended for both first-time programmer and professionals. This course begins with methods and algorithm development using Java, to advanced array concepts, inheritance, and polymorphism across different object types. After some basic syntax and program structure are examined, more advanced topics include exception handling; building GUIs with JavaFX; multi-threading, and Swing classes will be covered.

### **IS 5113 DATA MINING & DATA VISUALIZATION 3 HRS.**

This course covers data mining process and standards, data preparation, advanced data analysis, pattern recognition and algorithms. Data analysis tools are needed to process and filter the data, detect similarities, patterns, and trends. This course will teach dashboards and data visualization technologies. Dashboards and data visualization software are used to present the analyzed data, and to perform business analysis easily and quickly.

### **IS 5203 NETWORK MANAGEMENT 3 HRS.**

This course is an introduction to information systems infrastructure. Focus is on data communications and networks. Discussion covers layers network architectures and communication hardware. Emerging technologies such as social media, mobile computing, cloud computing, big data, and the Internet of Things are also examined. **Prerequisite: Graduate standing**

### **IS 5213 DATA SCIENCE & BIG DATA 3 HRS.**

This course introduces the latest data analytics tool and platforms, explores the rapidly developing field of Data Science. You will learn how best to gain actionable insights from big data, as well as to develop data solutions and data transformation road maps for businesses of varying sizes and complexity levels. The goal of this course is to maximize the utilization of available data and optimize the efficiency of decision-making. Previous experience with Hadoop, Spark or distributed computer is not required.

**IS 5303 INFORMATION SYSTEMS DEVELOPMENT & DESIGN 3 HRS.**

This course is a survey and overview of creating software solutions using professional programming practice including a study of systems analysis and design, using selected engineering and management science techniques and practices. Topics include requirements determination, modeling, decision making, and proposal development. The System Development Life Cycle Model, including system implementation and post implementation activities, is examined. Research and project assignments related to information systems analysis design, implementation, and/or project planning and control, require individual and group work.

**Prerequisite: Graduate standing**

**IS 5403 CYBERSECURITY 3 HRS.**

This course provides knowledge and practical skills required by any cybersecurity roles. Course assignments will require the use of technologies and tools to identify and address security threats, attacks and vulnerabilities. Emphasis is placed on the latest trends and techniques in risk management, risk mitigation, threat management and intrusion detection. This course also covers principles and foundations of network architecture and design, cryptography and PKI.

**Prerequisite: IS 5203 Network Management**

**IS 5803 INFORMATION SCIENCES CAPSTONE 3 HRS.**

This course is the capstone for all students in the Information Systems Master's program. 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. This course focuses on organizational performances as it relates to mission goals, and objectives. Students will get practice defining multifaceted 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.

**Prerequisite: Graduate standing, must take last semester of Information Studies program**

## 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 3-0-3**

An overview of laws impacting the auctioneering environment. Ethical standards and legal ramifications of actions within the auctioneering profession will be explored and discussed.

**Prerequisite: LAW 203**

**LAW 323 BANKRUPTCY 3-0-3**

An in-depth study of federal bankruptcy regulations as well as state and local regulation. The impact of bankruptcy on the auctioneering industry will be examined. **Prerequisite: LAW 203**

**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 313, 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 & 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**

**LAW 5003 LAW & THE ENGINEERING PROFESSIONAL 3-0-3**

This class will help students develop Intellectual Property and Contract acumen. Students will immerse themselves in practical application, critical reading and the interpretation of modern case law. Course will present: legal guidelines involving owners, design professionals, and contractors; sources of law, forms of association, and agency; including formation, contracts, interpretation, performance problems, disputes, and claims; standards of care and the management of construction claims; duties and obligations of the Engineering professional, the owner, and the contractor. **Prerequisite: Graduate standing**

**LAW 603 ADVANCED EMPLOYMENT LAW 3-0-3**

An in-depth study of the legal issues that may arise as a result of the employer-employee relationship. Topics include the establishment of employment and its terms, employer's obligation to employees, and termination of the employee relationship. The course examines federal and state statutory and case law on wage and hour issues, safety, and workplace discrimination, among other important topics. **Prerequisite: Must be admitted to the MSCJ**

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**LAW 613 ADVANCED CRIMINAL PROCEDURE: INVESTIGATION 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 Program**

**LAW 623 CHILDREN & 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 the MSCJ 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: CRJ 593. Must be taken in the final term of the MSCJ 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. **(Same course as FS 213 and INF 213) Prerequisite: ENG 113 or ENG 133, CSIT 103, INF 183**

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### **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 & 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.

### **LE 273 CRIMINAL PROCEDURES & 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 & 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 course as FS 343)**

### **LE 351 CRIMINALISTICS & CRIME SCENE LABORATORY 0-2-1**

A laboratory course which explores the basic techniques of collecting and analyzing evidence taken from crime scenes. **(Same course as FS 351) Prerequisite: FS 343 or LE 343**

### **LE 353 CRIMINALISTICS & 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. **(Same course as FS 353) Prerequisite: LE 343**

### **LE 363 INSTITUTIONAL CORRECTIONS & 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**

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### **LE 433 CRIMINAL JUSTICE CAPSTONE DEMONSTRATION 3-0-3**

This capstone course will provide students the opportunity to integrate and synthesize previous coursework in Criminal Justice. In addition, to the Capstone Demonstration Project, student will be required to take the exit criminal justice academic assessment for Criminal Justice Majors.

**Prerequisite: All required coursework following 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**

### **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 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**

### **LE 603 THEORY & PHILOSOPHY OF LEADERSHIP FOR LAW ENFORCMENT (3 HRS.)**

An exploration of the nature of leadership models and theories, examining these models through broad lens of law enforcement fields. Provides a description and analysis of these approaches to leadership, giving special attention to how the models can improve leadership in law enforcement personnel and organizations.

### **LE 613 ETHICS, CULTURE & POLITICS (3 HRS.)**

This course compares and contrasts the disciplines of leadership with an emphasis on fostering civil servant culture and personal ethics. Topics will include historical and contemporary leadership theories applied across a wide variety of law enforcement context.

### **LE 643 BUDGET & FINANCE FOR LAW ENFORCEMENT LEADERSHIP (3 HRS.)**

Students will take an in-depth look at accounting, finance and budgeting practices within the law enforcement field including fundamental concepts of accounting principles. Throughout this course students will gain practical skills for budgeting in law enforcement departments and organizations. These practices will include preparing financial reporting for local, city and or state agencies and officials.

# LEADERSHIP

## **LDR 101 LEADERSHIP PHILOSOPHY 1-0-1**

This course introduces the main concepts of organizational leadership. The role of the leader and the skillset needed to be an effective leader within the organization are discussed. The course sets a foundation for future classes in the program.

## **LDR 103 INTRODUCTION TO ORGANIZATIONAL LEADERSHIP 1-0-3**

This course introduces the principal frameworks in the field of Organizational Leadership and at the same time, develop skills to explore leadership challenges and opportunities. Individual, group and organizational levels of Organizational Leadership will be considered by utilizing the concepts and practices within the field of Organizational Behavior. **Prerequisite: LDR 101**

## **LDR 203 LEADERSHIP STRENGTHS & SKILLS 3-0-3**

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 & PRACTICE 3-0-3**

This course examines the major theories, principles, and concepts related to the art and practice of leadership. Multiple contexts of leadership will be analyzed, including self-leadership, one-on-one leadership, team leadership and organizational leadership. Readings, case studies, and activities promote the development of a deeper understanding of the historical, political, social, cultural, psychological and organizational contexts in which leadership occurs. Information presented in the course includes methods of social scientific inquiry through which students assess their individual leadership perspectives and competencies and develop a personal leadership philosophy.

## **LDR 313 TOPICS IN ORGANIZATIONAL LEADERSHIP 3-0-3**

Explore a special topic area within organizational leadership. **Prerequisite: LDR 103**

## **LDR 333 ORGANIZATIONAL LEADERSHIP DEVELOPMENT & CHANGE 3-0-3**

The course explores approaches to effective leadership within the context of organizational chaos and complexity. This course focuses on developing an understanding of the challenges posed by the changes taking place in the business and non-profit environment, as well as on the frameworks and skills that are critical to leading and managing organizational change. A variety of change situations and efforts will be discussed. **Prerequisite: LDR 103**

## **LDR 343 CONFLICT RESOLUTION 3-0-3**

Conflict in the workplace is inevitable in industries. In most situations, it is a necessary component of change, development, and growth. Leaders must know how to handle conflict and redirect conflict interaction to collaboration. This course will provide students with the essential

skills needed to identify, negotiate, compromise, and ultimately resolve conflict from a leadership perspective. **Prerequisite: LDR 103**

**LDR 403 CREATIVITY, INNOVATION, & INFLUENCE 3-0-3**

This course empowers leaders to envision and develop new ideas from inception through implementation. Readings and activities engage students in defining and building creativity, critical thinking, and collaboration skills they can use to facilitate innovation in individuals, groups, organizations, and communities.

**LDR 433 LEADERSHIP PRACTICUM 3-0-3**

This course deepens students' capacity for leadership, in addition to concluding the leadership minor by linking leadership practice to leadership theory. Students assume leadership responsibilities with a Trine University or community organization, program, or project in order to gain direct leadership experience and further the mission and goals of the selected organization. Students will set goals, practice and develop skills, reflect on experiences, evaluate actions, discuss lessons learned, and complete assignments. A well-written synthesis paper and a high-quality portfolio presentation are crafted to integrate students' learning about leadership and to provide a post-graduation plan for life-long leadership development. Current and active involvement in a leadership position is required for students in this class.

**LDR 453 LEADERSHIP CAPSTONE 3-0-3**

The capstone course provides a synthesis of leadership concepts, competencies and processes within an organizational context. Students will apply advanced leadership knowledge, theory and skills to challenging issues, and problems within organizations. Students will exhibit the knowledge and skills that they have learned throughout the BSOL program and apply to real world situation, developing a strategic plan to address a significant organizational issue, integrating problem-solving and critical thinking. Students will integrate their learned theory and knowledge, providing detail of the capstone problem. **Prerequisite: Completion of all leadership core courses or permission of the Dean of the College of Graduate and Professional Studies (Required for all BSOL students, transfer credits not accepted for this course).**

**LDR 5003 LEADERSHIP PHILOSOPHY 3-0-3**

This foundational course is an exploration of leadership models and theories. In this course, a special focus as to how the models and theories can improve leadership in organizations will be provided.

**LDR 5013 GROUP DYNAMICS WITHIN ORGANIZATIONS 3-0-3**

This course will equip students to fully understand the complexities of organizational systems and cultures, the ways in which these forces manifest themselves, and how leaders intentionally impact the shape that these forces take within their organizations. Principles and dynamics of group interaction and the application of various organizational systems will be examined. Students will reflect on how group dynamics are formed, their structures and how to manage attitudes and behavioral patterns of a group.

**LDR 5023 DECISION MAKING FOR LEADERS 3-0-3**

This course examines the characteristics of strategic leadership. The influence of decision-making on the organization will be studied.

**LDR 5032 ECONOMICS & ACCOUNTING PRACTICES FOR LEADERS 3-0-2**

This course will equip students to fully understand the complexities of different economic ways of thinking and understanding diverse economic systems. Explanations of how markets are competitive and how they are regulated will be examined. Accounting practices related to the creation of accounting statements are analyzed and technical skills needed to analyze these financial statements are developed.

**LDR 5043 ORGANIZATIONAL SYSTEMS & CULTURES 3-0-3**

The complexities of organizational systems and cultures, the ways in which these forces manifest themselves, and the means by which leaders intentionally impact these forces in their organizations will be explored.

**LDR 5053 LEGAL ISSUES IN ORGANIZATIONAL LEADERSHIP 3-0-3**

This course will provide students with information to fully understand the complexities of recognition of legal and ethical issues when making business decisions. Students will gain an enhanced understanding of legal rules and ethical constraints. Introduction of legal systems and legal concepts will be offered.

**LDR 5063 ORGANIZATIONAL DEVELOPMENT & CHANGE 3-0-3**

This course will explore the behavioral forces and relationships that influence organizational development, organizational effectiveness, and organizational change initiatives.

**LDR 5083 CONFLICT RESOLUTION FOR LEADERS 3-0-3**

Leaders must respond effectively in conflict situations and should willingly accept the consequences of their conflict responses. This course explores theories, methods, skills, and practices associate with successfully engaging in the dynamics of conflict interactions.

**LDR 5203 LEADERSHIP ETHICS 3-0-3**

An ethical leader can have a positive impact on an organization and its culture. The varied facets of ethics development and ethical decision-making will be explored.

**LDR 5223 ORGANIZATIONAL COMMUNICATION FOR LEADERS 3-0-3**

This course is designed to examine the theoretical and applied literature in the field of organizational communication relevant to organizational leadership.

**LDR 5253 TECHNOLOGY TOPICS FOR LEADERS 3-0-3**

With the vast and varied technologies available to leaders, it is no doubt managing these technologies can be challenging. Yet, leaders must have a sense of which technologies will help the organization and its members to be successful. While an organizational leader does not need to be a technology expert, having an awareness of the impact technology has on an organization is important.

**LDR 5333 RESEARCH METHODS 3-0-3**

This course explores quantitative, qualitative, and mixed methods approach to research. Students will identify, review, and analyze literature relevant to their organizational leadership interests.

**LDR 6563 ORGANIZATIONAL LEADERSHIP CAPSTONE 3-0-3**

The capstone focuses on the leadership competencies that the student has gained throughout the MSOL program. There is an emphasis on the ethical dimensions of problem solving in organizational leadership which will prepare graduates to succeed, lead and serve.

**LDR 7013 QUANTITATIVE METHODS IN LEADERSHIP RESEARCH 3-0-3**

This course will involve using a software application to analyze univariate, bivariate, and multivariate parametric and non-parametric descriptive and inferential statistics, and interpreting, reporting, and presenting data analyses results. Quantitative data analysis required to answer research questions, test hypotheses, and establish psychometric qualities of measures in complex research designs. The course includes: creating data files, working with data, descriptive statistics, t-test, one-way and multi-way (factorial) analysis of variance (ANOVA), repeated measures ANOVA, analysis of covariance (ANCOVA), correlation and regression analysis, reliability and validity analysis, and selected nonparametric tests.

**LDR 7023 QUALITATIVE METHODS IN LEADERSHIP RESEARCH 3-0-3**

The course is designed to provide students with more in-depth understanding of naturalistic, qualitative research methods. Students will review philosophical assumptions underlying qualitative paradigms and will learn about design, purposeful sampling, field work, and data collection methods. Course will introduce students to current data analysis techniques and computer software used to analyze qualitative data. Throughout the course, students will read and critically evaluate peer-reviewed qualitative studies. Students will also gain first-hand experience in the qualitative research process by designing and conducting a student, analyzing and interpreting their data, and writing and presenting a report on their findings.

**LDR 7103 LEADERSHIP THEORY DEVELOPMENT 3-0-3**

This course will provide students with the knowledge, skills, and understanding of leadership theory and practice within organizations. Students will examine the components of leadership and the interrelational effects of these elements within organizations. Students will gain both the theoretical and practical skills within the practice of leadership and potential applications of this knowledge within their professional lives. The course will consider leadership theories and approaches, examine leadership themes, organizational leadership, and consider how all of this applies in application within real world situations.

**LDR 7123 COMMUNICATION THEORY 3-0-3**

This course will apply communication theory and practice to a broad range of communication phenomena in intrapersonal, interpersonal and public communication settings. The approach will acknowledge the interdisciplinary communication theory discipline that draw many of its theoretical ideas about human communication from physiology, sociology, cultural studies, linguistics, philosophy, and literary studies. The course focuses on developing thoughts and research related to mass communication in the twenty-first century.

**LDR 7133 ETHICS & SOCIAL RESPONSIBILITY 3-0-3**

This course applies ethical theory and practice to leadership environments. Review of various ethical systems, cultural variations, and approaches in which organizations develop and implement ethics programs. A variety of cases and projects are included in the development of student understanding. Students will identify and explore the tools, concepts, and frameworks used by companies currently pursuing sustainable business opportunities.

**LDR 7143 ECONOMIC CONCEPTS FOR LEADERS 3-0-3**

This course will describe how economic theory is linked to economic evaluation techniques like cost-benefit and cost-effectiveness analysis and to introduce students to many concepts that are specific to economic evaluation. Explores other theories and concepts, including cost measurement, benefit valuation, and incremental decision-making.

**LDR 7153 LEADING ACROSS CULTURES 3-0-3**

This course will identify culturally sensitive leadership skills, styles, practices, models, trends, theories, and concepts. Attention is given to international ethical, diversity, and conflict management research and practices. The course provides an in-depth review and analysis of the latest theories and research on leadership in global and multicultural organizations.

## **MANAGEMENT**

**MGT 303 RISK MANAGEMENT 3-0-3**

This course overviews key organizational risk and crisis management issues by focusing on organizational and risk fundamentals, enterprise risk management, project management, crisis management and regulatory issues. Incorporating the concepts of effective decision making to align organizational goals with performance and crisis response.

**MGT 313 HUMAN 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. **Corequisite: MGT 363**

**MGT 323 LEADERSHIP 3-0-3**

This course examines leadership, influence, and power across a variety of disciplines, with a strong emphasis on ethics. This course focuses on a Transformational based approach to leadership and leadership development as well as the skills necessary for facilitating positive change in groups, organizations, and communities. Active learning opportunities to understand and practice essential skills such as continual learning, powerful communication, problem solving, managing process, goal achievement, conflict resolution, win-win negotiating, and empowering stewardship are woven throughout the course. Effective leadership practice through emphasis on strengths development is the goal of this class. Historical, literary, and contemporary examples of successful leaderships provide a framework for examining the theories and practice of leadership and power. **Prerequisite: PSY 113 or SM 393**



**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: BA 123**

**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. **(Same course as HR 313)**  
**Prerequisite: MGT 313**

**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**

**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. **Prerequisite: BA 123 or PSY 113**

**MGT 373 FACILITY MANAGEMENT 3-0-3**

This course will expose students to the key concepts of facility management. Topics include identifying core versus non-core business activities, budgeting and resource allocation, short and long term facility maintenance, facility supervision, workplace design, spatial management, energy conservation, construction structures and materials, and building services (sewer/water, gas, energy distribution, heating, ventilation, air conditioning). Students will be exposed to different types of facilities and the specific considerations for each type of facility. **Prerequisite: BA 123 or PSY 113**

**MGT 383 PRINCIPLES OF PROJECT MANAGEMENT 3-0-3**

This course will expose students to the key concepts of project management. Topics include project planning, implementation and controlling, time management, budgeting, resource allocation, quality, human resource considerations, negotiations, scheduling, and auditing. Students will also be exposed to project management software, tools, and methods used by project managers, and event management issues. **(Same course as HR 403) Prerequisite: BA 123**

**MGT 403 PRINCIPLES OF HOSPITALITY MANAGEMENT 3-0-3**

This course will expose students to the many facets of the hospitality and tourism industry. Topics to be included will be the policies, procedures, marketing, promoting, pricing, and planning of the wide range of operations. This class will incorporate both classroom and field experiences so that the student understands what is required to be successful in this very diverse industry. **Prerequisite: BA 123, MK 203, ENG 103**

**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.

**Prerequisites: MA 253 and MGT 353**

**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.

**Prerequisites: MA 253 and MGT 353**

**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: Senior standing (last two semesters of school)**

**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: FIN 303 and MGT 353**

**MGT 473 CAPSIM BUSINESS SIMULATION 3-0-3**

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 College of Graduate and Professional Studies.**

**MGT 483 CAPSTONE 3-0-3**

This capstone course will provide students with the opportunity to integrate and synthesize previous coursework 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 College of Graduate and Professional Studies.**

**MGT 493 SELECTED TOPICS 3-0-3**

Offered to treat specific or current business or management issues in depth.

**MGT 523 COMMUNICATIONS, LEADERSHIP & 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 & 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 5013 ADVANCED PLANT MANAGEMENT 3-0-3**

Systems and methods associated with planning and monitoring in the manufacturing environment including forecasting, master production scheduling, materials requirement planning, and shop floor engagement. Integrated aspects of manufacturing resource planning and enterprise resource planning as well as the effects of just-in-time administration and the theory of constraints. **Prerequisite: Graduate standing**

**MGT 5093 BUSINESS STRATEGY & 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: Must be completed in final term of graduate program.**

**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**

**MGT 6023 INTERNATIONAL MARKETING & 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

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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 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**

### **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**

### **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 MSOL Program.**

### **MGT 6623 BUSINESS MANAGEMENT & 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**

### **MGT 6663 SUSTAINABLE & 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 MSOL Program**

## MANUFACTURING TECHNOLOGY

### **MT 113 MANUFACTURING PROCESSES & MATERIALS 3-0-3**

A study of commonly used manufacturing processes (machining, casting, extrusion, forging and others) with emphasis on important engineering materials used in production. Materials studied include metals, plastics, ceramics, and composites. **Prerequisites: ETD 173**

### **MT 123 INTRODUCTION TO AUTOCAD DESIGN 3-0-3**

An introductory course which studies the concept of solid modeling and its application in industry. In this course students will learn the fundamentals of 2D and Solid Modeling utilizing AutoCAD software which includes the study of detail drawing creation. **Prerequisites: "C" or better in ETD 103**

### **MT 253 BASIC DIMENSIONAL METROLOGY 2-0-3**

Emphasis on methods and principles of measuring basic physical dimensions for inspection and quality assurance/control with an emphasis on manufacturing technology. Also covered are the basics of gaging and coordinate measuring systems. **Prerequisites: ETD 113 and ETD 173**

### **MT 313 DESIGN FOR MANUFACTURE & ASSEMBLY 3-0-3**

Principles and methodologies for designing parts and products for: ease and efficiency of manufacture and assemble; maintenance and usability during the service life, along with disposal and recycling at the end of service life. Students will be able to apply DFM and quality assurance principles to lower the cost of designing, commissioning, and using new products. **Prerequisites: MT 113 and MT 253**

### **MT 323 USING SOLIDWORKS TO GENERATE WORKING DRAWINGS 3-0-3**

The emphasis in this course is on being able to turn mechanically produced drawings, CAD solid models, prototypes, or sketches into working drawings. These drawings are used to manufacture components/parts into viable and economically produced products. **Prerequisites: ETD 173 and ETD 113**

### **MT 403 QUALITY ASSURANCE FOR MANUFACTURING TECHNOLOGY 3-0-3**

This course examines the critical nature of quality assurance for producing high reliability and economically produced products. The emphasis is on how quality techniques (especially SPC) can be integrated into manufacturing processes such that products are produced reliably to exacting manufacturing specifications, with minimal scrap and downtime being created. The statistical

nature of manufacturing processes is closely examined along with concepts of six-sigma and ISO 9000. **Prerequisites: MA 253, MT 113 or MT 313**

**MT 413 MANUFACTURING TECHNOLOGY CAPSTONE PROPOSAL 3-0-3**

Introduction to manufacturing process design and project management. Integration of previous work into a complete manufacturing process plan proposal and explore how product designs are turned into successful manufactured products. **Prerequisites: Senior standing**

**MT 423 MANUFACTURING TECHNOLOGY CAPSTONE PROJECT 3-0-3**

This class results in the creation of a comprehensive plan for producing a manufactured product or process. Students work in teams to complete the capstone project and documentation for presentation to the course instructor and others. **Prerequisites: MT 413**

## **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. **Prerequisites: BA 123**

**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. **Prerequisites: MK 203, SP 203 or COM 163**

**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, MK 203**

**MK 353 THE GLOBAL CONSUMER 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, 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 course as PSY 3063) Prerequisite: MK 203**

**MK 373 GRAPHIC DESIGN FUNDAMENTALS 3-0-3**

Students will gain design theory, knowledge and experience applying the design process, design principles and design elements to plan and implement ideas and experiences with visual and textual content into industry-quality graphic design projects. **Prerequisite: Junior standing**

**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, 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 453 STRATEGIC DIGITAL MARKETING CERTIFICATION 3-0-3**

The number of digital marketing tools and the complexity of today's customer are rapidly evolving. The skills to design, analyze and evaluate email, content, social and search strategies are therefore critical for marketers' success. In this course, students will complete a suite of market-leading digital marketing and social media certification programs and use their acquired skills to make data-rich, strategic decisions about marketing strategy development and implementation. Certifications will include Google Adwords; Google Analytics; Hubspot Email, Inbound, and Content Marketing; Facebook Blueprint; Lynda.com Search Engine Optimization (SEO) and Mobile Marketing Fundamentals. **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 DIGITAL ADVERTISING (SEM/SEO) 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. **Prerequisite: MK 203**

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### **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: MK 203, MK 463, and Senior standing (last two semesters of school)**

### **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, and product) as they relate to the target market. The strategic planning process and how it relates to the overall profitability of the marketing department and a corporate structure will be studied.

**Prerequisite: Graduate standing**

## **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 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 133 QUANTITATIVE REASONING 3-0-3**

A survey of skills for understanding quantitative data in modern life and making decisions based upon quantitative information. This course focuses on: problem-solving and the application of mathematical concepts (such as measurement, geometry, statistics, and algebra) in various contexts. Interpretation (and misinterpretation) of percentages, probabilities and statistics in contemporary decision-making; understanding of survey and experimental results as reported in context; and making logical and persuasive quantitative arguments. Examples incorporating mathematical arguments will be taken from a wide variety of fields. **Prerequisite: adequate SAT/ACT Mathematics score or approval from mathematics Department Chair.**

**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, and infinite series. Uses symbolic algebra software. **Prerequisite: "C" or better in MA 134 or equivalent**

**MA 173 ESSENTIAL CALCULUS 3-0-3**

Topics include: limits, introduction to differential and integral calculus with applications, and fundamental theorem of integral calculus with applications. **Prerequisite: MA 113**

**MA 184 MATHEMATICS FOR ELEMENTARY TEACHERS I 4-0-4**

Topics include: numeration systems, set theoretic development of whole number system, decimals, percents, ratios, elementary number theory, elementary algebra, and problem solving techniques. Designed specifically for elementary and middle school curricula emphasizing NCTM standards.

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### **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 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, and 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 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: 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 & 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 Department Chair for independent study policy)**

## **MECHANICAL & AEROSPACE ENGINEERING**

**MAE 201 INTRODUCTION TO PROGRAMMING IN MATLAB 0-2-1**

An introduction to numerical methods of solving engineering problems. Introduction to programming in MATLAB. **Prerequisite: MA 113 or higher**

**MAE 202 MECHANICAL ENGINEERING ANALYSIS 2-0-2**

An introduction to analytical and numerical methods of solving mechanical engineering problems. An introduction to various topics of mechanical engineering focusing on the interrelationship between mathematics, natural sciences, and engineering design. **Prerequisite: MA 134, Corequisite: EGR 143 and MAE 201**

**MAE 241 MANUFACTURING PROCESSES & EQUIPMENT LAB 0-2-1**

Demonstrations of sand molding, metal casting, metal removal processes (turning, milling, drilling, grinding), deformation processing, and welding processes. **Prerequisites: ES 233, Corequisite ES 243, MAE 242**

**MAE 242 MANUFACTURING PROCESSES & EQUIPMENT 2-0-2**

An examination of commonly used engineering materials and the manufacturing processes and machines used in processing these materials. **Prerequisites: ES 233, Corequisite ES 243**

**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 201, MAE 202**

**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 psychometrics. Reacting mixtures and combustion. Compressible flow. **Prerequisite: ES 313 and MAE 201**

**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 213**

**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

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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, MAE 201 and MAE 202**

### **MAE 413 THERMO-FLUID COMPONENT DESIGN 3-0-3**

Introduction to components for energy transfer including ducts, valves, pumps, fans, compressors, heat exchangers, and burners. Design of piping systems and fluid networks. Analysis of pumps and design of systems including pumps. Design of duct systems. Analysis of fans, blowers, compressors, and design of systems which use them.

**Prerequisites: ES 343, MAE 3033**

### **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**

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 & 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, MAE 3033, 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 & 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 242 or consent of instructor**

## **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 103 INTRODUCTION TO THEORY 1-0-3**

Music Theory is a study of basic music theory concepts including notation of pitch, rhythm and meter, scales, keys, and key signatures, intervals, triads, and seventh chords.

### **MUS 112 PIANO LAB 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 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 3-0-3**

An introduction to the music of the western world, including musical styles of the past and styles and forms of contemporary music literature. Previous music training not a prerequisite. This course explores how people define, create, value, and use music in cultures around the world. The basic musical elements of rhythm, melody, timbre, texture harmony, and form are explored through this multicultural approach to music appreciation.

**MUS 323 MUSIC LITERATURE I 3-0-3**

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 brass wind instruments. The ensemble will perform a variety of music and can accommodate diverse brass instrumentation. **Prerequisite: Players must have prior playing experience on their instrument and at least moderate music reading skills. Players of small brass instruments must provide their own instrument in good working order. Larger instruments may be available from the University.**

**MUS 1121 BRASS ENSEMBLE 0-1-1**

Brass Ensemble is open to all students and community members who play brass wind instruments. The ensemble will perform a variety of music and can accommodate diverse brass instrumentation. **Prerequisite: Players must have prior playing experience on their instrument and at least moderate music reading skills. Players of small brass instruments must provide their own instrument in good working order. Larger instruments may be available from the University.**

**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 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

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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.

## **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 213 THEORIES & PHILOSOPHIES OF SOCIAL INNOVATION 3-0-3**

Students are introduced to the altruistic and philanthropic drivers of social innovation, specifically focusing on how the desire to accrue value for society is becoming more influential than profit motive. The course asks students to examine (through a number of lenses) the emergence of the humanistic element in what have traditionally been capitalistic and technological fields. **(Same course as SI 213) Prerequisites: ENG 103, PSY 113**

**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 & SOCIETY 3-0-3**

An interdisciplinary effort to place modern technology within a social, cultural, and historical context. **(Same course as SOC 333) Prerequisite: ENG 113 or ENG 133**

**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**

## **PHYSICAL THERAPIST ASSISTANT**

**PTA 112 HEALTH BEHAVIOR SCIENCE (2 HOURS)**

Students will explore and analyze how human actions, cognitions, communications, and environments 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.

**PTA 113 CLINICAL PRACTICE I (3 HOURS)**

Students learn through lecture, discussion, and guided practice of important skills for patient management in clinical practice. Examples of these skills include: effective patient interviewing and documentation; assessment of impairments including vital signs, sensations, 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, disablement, and evidence-based practice models.

**PTA 123 CLINICAL PRACTICE II (3 HOURS)**

Students learn through lecture, guided practices, 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.

**PTA 133 PROFESSIONAL DEVELOPMENT I (3 HOURS)**

Students will learn through lecture, discussion, and case-based discussion the roles of the physical therapist assistant in practice settings and as part of an inter-professional team.

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Students will explore their beliefs and biases and their relationships and responsibilities, legally and ethically to the State, their profession, and their patients, including understanding the Standards of Ethical Conduct and its relationship to reimbursement, whistleblowing, societal and psychosocial influences.

### **PTA 142 PRACTICAL RESEARCH METHODS (3 HOURS)**

Student will demonstrate an understanding of current scientific and clinically relevant literature. Through an understanding and application of statistical methods and principles they will be able to determine the relative importance and significance of a health-care related studies. They will explore evidence based practice by demonstrating their knowledge through written and oral examination and presentation of the value of published research, describe how it will affect their practice and what the clinical relevance is in their treatment of patients.

### **PTA 143 LIFE SPAN (3 HOURS)**

Students learn through lecture, discussion, and guided practice, the major components of development from birth through adolescence and into senescence. Theories that support our understanding of developmental delays and disabilities, and guided clinical decisions are also explored. Additionally considered are pediatric public laws, child abuse, and therapeutic interactions with families. 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.

### **PTA 144 FUNCTIONAL ANATOMY (3 HOURS)**

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 principle of function. The material covered in this course includes anatomy and kinesiology of the upper extremities, lower extremities, head, neck, torso, and lumbosacral areas. Classroom and online lectures are complemented by laboratory experiences that include study of prosecuted human cadavers, and instructional palpation of live humans.

### **PTA 153 KINESIOLOGY (3 HOURS)**

Through lecture and lab experiences students will learn the components of practical kinesiology including osteokinematics, arthrokinematics, and kinesiological function of the musculoskeletal system including the external and internal forces generated by acting on the musculoskeletal system. Students will be able to utilize the concepts and principles learned to gather data and analyze motion for relevant application in a patient's plan of care. The course is organized anatomically regionally and will encompass posture and gait as a result of the biomechanical and kinesiological musculoskeletal system as a whole. Students will demonstrate their knowledge and proficiency in concepts discussed in class through demonstration in lab, quizzes and written tests.

### **PTA 163 CLINICAL PHYSIOLOGY (3 HOURS)**

Students will explore the physiological and functional responses and adaptations of the human body to exercise, and the influences of structural and physiological changes with growth, aging,

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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 guided reading and discussion. Students will be able to describe the fundamental basis of disease including inflammation, cardiovascular diseases, vascular diseases, orthopedic conditions and repair of bone and soft tissue injuries and other diseases that can impact the ability to provide care and procedural interventions.

### **PTA 213 PROFESSIONAL DEVELOPMENT II (3 HOURS)**

Students will examine and share clinical experiences in light of their roles as PTAs, their patient/client interaction and as influenced on their knowledge, biases/assumptions and regulations and rules on the worksite regarding billing, care and collegial relationships. Students will learn documentation standards and needs for clinical settings to convey pertinent and understandable information. Students will explore these topics through reflection and writing with case presentation. Students will also take part in preparation for the NPTE.

### **PTA 223 NEUROMUSCULAR REHABILITATION I (3 HOURS)**

This course focuses on the neuromuscular system, students will be introduced to the management of children and adults with complex CNS and multisystem disorders and co-morbidities. Instruction occurs via lecture, discussion of case-based and problem-based assignment scenarios, and guided laboratory practice. Students will examine, plan and practice delivering procedural interventions, collecting data, following and adaptation plans and documentation of care. Students will consider population type engagement in problem solving skills and apply knowledge gained in prior coursework including anatomy, kinesiology, physiology, pathophysiology and health behaviors. The appropriate use of assistive technologies is also explored.

### **PTA 233 MUSCULOSKELETAL REHABILITATION I (3 HOURS)**

Through lecture, case-based and problem-based assignments, students will examine, plan and practice delivering interventions, collecting data, flowing and adapting plans and documentation of care in case-based and problem-based settings. Common impairments related to orthopedic conditions of the upper quarter, head, neck and thoracic spine will be explored. Students will consider population type engagement in problem solving skills and apply knowledge gained in prior course work including anatomy, kinesiology, physiology and pathophysiology and health behaviors.

### **PTA 243 SPECIAL TOPICS (3 HOURS)**

Special topics examines the care related to special populations including acute care, prosthetics and orthotics, cardiopulmonary rehabilitation, women's health, oncological considerations, pain and chronic pain conditions. Students will also learn areas of pharmacology and laboratory values that are gathered during chart review that would potentially have an impact on the care the student delivers. Learning experiences will include lecture, guided practice in laboratory settings, discussion and written assignments.

### **PTA 253 CLINICAL PRACTICE III (3 HOURS)**

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, 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.

**PTA 256 CLINICAL EXPERIENCE II (6 HOURS)**

During this eight week full-time clinical internship students participate, with supervision, in the provision of major components of physical therapy care including clinical reasoning and intervention skills and procedures. An emphasis is placed on integration of professional behaviors, data collection, progression, and documentation. An emphasis is placed on the development of entry-level PTA competencies and behaviors as students are given opportunities to practice components of the physical therapist assistant's role.

**PTA 263 MUSCULOSKELETAL REHABILITATION (3 HOURS)**

Through lecture, case-based and problem-based assignments, students will examine, plan and practice delivering interventions, collecting data, following and adapting plans and documentation of care in case-based and problem-based settings. Common impairments related to orthopedic conditions of the lower quarter, lumbar spine and pelvis will be explored. Students will consider population type engage in problem solving skills and apply knowledge gained in prior coursework including anatomy, kinesiology, physiology and pathophysiology and health behaviors.

**PTA 266 CLINICAL EXPERIENCE III (6 HOURS)**

During this eight week full-time clinical internship students participate, with supervision, in the provision of major components of physical therapy care including clinical reasoning and intervention skills and procedures. An emphasis is placed on integration of professional behaviors, data collection, progression, and documentation. An emphasis is placed on the development of entry-level PTA competencies and behaviors as students are given opportunities to practice components of the physical therapist assistant's role.

**PTA 273 NEUROMUSCULAR REHABILITATION II (3 HOURS)**

This course focuses on the neuromuscular system, students will be introduced to the management of children and adults with complex CNS and multisystem disorders and co-morbidities. Instruction occurs via lecture, discussion of case-based and problem-based assignment scenarios, and guided laboratory practice. Students will examine, plan and practice delivering procedural interventions, collecting data, following and adapting plans and documentation of care. Students will consider population type engagement in problem solving skills and apply knowledge gained in prior coursework including anatomy, kinesiology, physiology, pathophysiology and health behaviors. The appropriate use of assistive technologies is also explored.

**PTA 283 CLINICAL EXPERIENCE I (3 HOURS)**

During this 8 week full-time clinical internship students are engaged in clinical observation and supervised application of basic clinical reasoning and intervention skills and procedures. An emphasis is placed on integration of professional behaviors, data collection, progression, and documentation.



## PHYSICIAN ASSISTANT STUDIES

### **PAS 5001 CLINICAL GENETICS (1 CREDIT)**

This course will focus on the clinically relevant genetics and genomics necessary for clinical practice. This survey course covers introductory genetics, inheritable patterns disease, specific hereditary diseases and clinical applications of genetics/genomics. **Prerequisite: Matriculation into the PA program.**

### **PAS 5002 DIAGNOSTIC TECHNIQUES I – LABORATORY MEDICINE (2 CREDITS)**

This first of a series of three lecture course with a minimal laboratory component in which students acquire and practice a variety of diagnostic techniques. In this course the student will be introduced to laboratory medicine and the interpretation and performance of these studies.

### **PAS 5003 CLINICAL PHYSIOLOGY (3 CREDITS)**

This lecture and lab course is a graduate level survey of clinically relevant human physiology. **Prerequisite: Matriculation into the PA program.**

### **PAS 5004 CLINICAL ANATOMY (4 CREDITS)**

This lecture and lab course consists of an in-depth study of gross human anatomy along with applications to a clinical setting. The course consists of a mixture of techniques, including lecture, discussion, and examination of cadaveric specimens. This lecture and lab course is a graduate level survey of clinically relevant human physiology. **Prerequisite: Matriculation into the PA program.**

### **PAS 5012 CLINICAL SKILLS I: MEDICAL DOCUMENTATION & INTERVIEWING (2 CREDITS)**

This is the first of a series of four lecture and lab courses in which students acquire and practice various diagnostic and therapeutic clinical skills. In this course, the emphasis will be on the art of communication in medicine, the medical interview, and the proper documentation of medical encounters.

### **PAS 5022 PA PROFESSIONAL PRACTICE (2 CREDITS)**

In this course, students learn about issues pertinent to the PA profession. The course covers the profession's history and future directions, roles and responsibilities, and organizations. The course also includes an introduction to the psychosocial aspects of medical care and medical ethics. **Prerequisite: Matriculation into the PA Program. (Pass/Fail).**

### **PAS 5052 CLINICAL APPLICATION & REFLECTION EXPERIENCE I (2 CREDITS)**

This is the first in a series of four courses where students work in teams to practice and refine skills, employ problem-solving, participate in reflective experiences, and assume professional roles. Students are expected to retain and apply knowledge from concurrent and previous coursework. Examples of experiences include simulation/standardized patients, interprofessional education opportunities, preclinical patient exposures, and case studies. Professional development areas include professional communications and behaviors, conflict resolution, and stress management. **Prerequisite: Matriculation into the PA Program. (Pass/Fail)**

**PAS 5102 CLINICAL SKILLS II: PHYSICAL EXAM & DOCUMENTATION (2 CREDITS)**

This is a second series of four lecture and lab courses in which students acquire and practice various diagnostic and therapeutic clinical skills, such as performance of health histories and physical exams, and proper documentation. In this course, the emphasis is on the performance and documentation of a complete (head to toe) physical examination. **Prerequisite: Successful completion of previous PA Program semester courses.**

**PAS 5110 CLINICAL MEDICINE & THERAPEUTICS I (10 CREDITS)**

This is the first in a series of three courses for the study of the diagnosis and management of common acute, emergent, rehabilitative, and chronic medical disorders across the lifespan. The relevant anatomy, physiology, and pathophysiology of disease states are discussed, followed by incidence/prevalence, associated risk factors, signs and symptoms, clinical findings, diagnostic criteria, diagnostic tests and procedures, pharmacologic and non-pharmacologic therapeutic options, prevention, patient education, follow-up care, course, and prognosis. This 3-series course series collectively covers disorders categorized under the following organ systems: cardiovascular, dermatology, ophthalmology, EENT, endocrine, GI/Nutritional, GU, hematology, infectious disease, musculoskeletal/rheumatology, neurological, psychiatry/behavioral medicine, pulmonary, and reproductive. **Prerequisite: Successful completion of the Fall PA Curriculum.**

**PAS 5112 CLINICAL DIAGNOSTICS II - EKG (2 CREDITS)**

The first of a series of three lecture courses with a minimal laboratory component in which students acquire and practice a variety of diagnostic techniques. In this course the student will be introduced to laboratory medicine in the interpretation and performance of these studies.

**PAS 5113 CLINICAL SKILLS II: PHYSICAL EXAMINATION & HISTORY (3 CREDITS)**

This is the second of a series of four lecture and lab courses in which students acquire and practice various diagnostic and therapeutic clinical skills, such as performance of health histories and physical exams, and proper documentation. In this course, the emphasis is on the performance and documentation of a complete (head to toe) physical examination. **Prerequisite: PAS 5012**

**PAS 5152 CLINICAL APPLICATION & REFLECTION EXPERIENCE II (2 CREDITS)**

This is the second in a series of four courses where students work in teams to practice and refine skills, employ problem-solving, participate in reflective experiences, and assume professional roles. Students are expected to retain and apply knowledge from concurrent and previous coursework. Examples of experiences include simulation/standardized patients, interprofessional education opportunities, preclinical patient exposures, and case studies. Professional development areas include professional communication and behavior, conflict resolution, and stress management. **Prerequisite: PAS 5052. (Pass/Fail)**

**PAS 5161 CLINICAL PHARMACOLOGY I (1 CREDIT)**

This course is the first in a series of three courses for the study of clinical pharmacology appropriate to the professional physician assistant role. The basic principles of pharmacology, pharmacodynamics and pharmacokinetics are discussed. This 3-series course collectively provides an introduction to the pharmacologic processes in the care and promotion of wellness across the lifespan, including the medications commonly used to treat human disorders, their classification, mechanisms of actions, indications, contraindications/cautions, formulations,

routes of metabolism and excretion, adverse reactions, and drug interactions. **Prerequisite: Matriculation into the PA Program.**

### **PAS 5171 EVIDENCE BASED PRACTICE I (1 CREDIT)**

In this two-course series, students are taught evidence-based methodologies to evaluate clinical questions related to diagnosis, therapy, harm, and prognosis. This includes how to effectively search the literature, as well as principles of research and statistical analysis for the critical appraisal of published research and for conducting future research or clinical quality improvement projects. Topics include research ethics, study designs, sampling methods, design validity, descriptive and inferential statistics, selecting the appropriate statistical test, and hypothesis testing. During these courses, students initiate a group research project that will be continued in the Graduate Project I, II, and III courses with the identification of a research problem, formulation of a research question, and the drafting of a literature review and study proposal. **Prerequisite: Successful completion of the Fall PA Curriculum. (Pass/Fail)**

### **PAS 5205 CLINICAL MEDICINE & THERAPEUTICS II (5 CREDITS)**

This is the second in a series of three courses for the study of the diagnosis and management of common acute, emergent, rehabilitative, and chronic medical disorders across the lifespan. The relevant anatomy, physiology, and pathophysiology of disease states are discussed, followed by incidence/prevalence, associated risk factors, signs and symptoms, clinical findings, diagnostic criteria, diagnostic tests and procedures, pharmacologic and non-pharmacologic therapeutic options, prevention, patient education, follow-up care, course, and prognosis. This 3-series course series collectively covers disorders categorized under the following organ systems: cardiovascular, dermatology, ophthalmology, EENT, endocrine, GI/Nutritional, GU, hematology, infectious disease, musculoskeletal, neurological, psychiatry/behavioral medicine, pulmonary, and reproductive. **Prerequisite: PAS 5110.**

### **PAS 5212 CLINICAL SKILLS III – SPECIAL POPULATIONS (2 CREDITS)**

This is the third of a series of four lecture and lab courses in which students acquire and practice various diagnostic and therapeutic clinical skills, such as performance of health histories and physical exams, interpretation of laboratory, electrocardiographic, and imaging studies, the performance and interpretation of diagnostic and therapeutic procedures, and training in basic and advanced cardiac life support. In this lab course, the emphasis is on the performance and documentation of problem-faced medical interviews and physical examinations, and an introduction to specialty-focused medical interviews and physical examinations across the lifespan. **Prerequisite: PAS 5115; Corequisite: PAS 5213**

### **PAS 5213 CLINICAL SKILLS III – IMAGING & PFT's (3 CREDITS)**

This is the third of a series of four lecture and lab courses in which students acquire and practice various diagnostic and therapeutic clinical skills, such as performance of health histories and physical exams, interpretation of laboratory, electrocardiographic, and imaging studies, the performance and interpretation of diagnostic and therapeutic procedures, and training in basic and advanced cardiac life support. In this course, the lecture emphasis is on the interpretation of commonly performed imaging studies and pulmonary function tests. **Prerequisite: PAS 5115; Corequisite: PAS 5212**

**PAS 5252 CLINICAL APPLICATION & REFLECTION EXPERIENCE III (2 CREDITS)**

This is the third in a series of four courses where students work in teams to practice and refine skills, employ problem-solving, participate in reflective experiences, and assume professional roles. Students are expected to retain and apply knowledge from concurrent and previous coursework. Examples of experiences include simulation/standardized patients, interprofessional education opportunities, preclinical patient exposures, and case studies. Professional development areas include professional communication and behavior, conflict resolution, and stress management. **Prerequisite: PAS 5152. (Pass/Fail)**

**PAS 5261 CLINICAL PHARMACOLOGY II (1 CREDIT)**

This course will be the second in a series of three courses for the study of clinical pharmacology appropriate to the professional physician assistant role. The basic principles of pharmacology, pharmacodynamics and pharmacokinetics are applied to generate pharmacologic management plans for the diseases/disorders based upon current clinical practice guidelines and other evidence-based resources. This 3-series Clinical Pharmacology Course collectively provides an introduction to the pharmacologic processes in the care and promotion of wellness across the lifespan, including the medications commonly used to treat human disorders, their classification, mechanisms of actions, indications, contraindications/cautions, formulations, routes of metabolism and excretion, adverse reactions, and drug interactions. **Prerequisite: PAS 5161**

**PAS 5310 CLINICAL MEDICINE & THERAPEUTICS III (10 CREDITS)**

This is the third in a series of three courses for the study of the diagnosis and management of common acute, emergent, rehabilitative, and chronic medical disorders across the lifespan. The relevant anatomy, physiology, and pathophysiology of disease states will be discussed, followed by incidence/prevalence, associated risk factors, signs and symptoms, clinical findings, diagnostic criteria, diagnostic tests and procedures, pharmacologic and non-pharmacologic therapeutic options, prevention, patient education, follow-up care, course, and prognosis. This 3-series course series collectively covers disorders categorized under the following organ systems: cardiovascular, dermatology, ophthalmology, EENT, endocrine, GI/Nutritional, GU, hematology, infectious disease, musculoskeletal, neurological, psychiatry/behavioral medicine, pulmonary, and reproductive. **Prerequisite: PAS 5205.**

**PAS 5315 CLINICAL SKILLS IV – PROCEDURES (5 CREDITS)**

This is the fourth of a series of four lecture and lab courses in which students acquire and practice various diagnostic and therapeutic clinical skills, such as performance of health histories and physical exams, interpretation of laboratory, electrocardiographic, and imaging studies, the performance and interpretation of diagnostic and therapeutic procedures, and training in basic and advanced cardiac life support. In this course, the emphasis is on performance and interpretation of common diagnostic and therapeutic procedures including an orientation to the operating room, completion of advanced cardiac life support training, as well as the continuation of specialty-focused medical interviews and physical examinations across the lifespan from pediatrics to geriatrics, including the unique healthcare needs for women, diverse patient populations, and patients with disabilities. **Prerequisite: PAS 5212 and PAS 5213**

**PAS 5352 CLINICAL APPLICATION & REFLECTION EXPERIENCE IV (2 CREDITS)**

This is the fourth in a series of four courses where students work in teams to practice and refine skills, employ problem-solving, participate in reflective experiences, and assume professional

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roles. Students are expected to retain and apply knowledge from concurrent and previous coursework. Examples of experiences include simulation/standardized patients, interprofessional education opportunities, preclinical patient exposures, and case studies. Professional development areas include professional communication and behavior, conflict resolution, and stress management. **Prerequisite: PAS 5252. (Pass/Fail)**

### **PAS 5361 CLINICAL PHARMACOLOGY III (1 CREDIT)**

This course will be the third in a series of three courses for the study of clinical pharmacology appropriate to the professional physician assistant role. The basic principles of pharmacology, pharmacodynamics and pharmacokinetics are applied to generate pharmacologic management plans for the diseases/disorders based upon current clinical practice guidelines and other evidence-based resources. This 3-series Clinical Pharmacology Course collectively provides as introduction to the pharmacologic processes in the care and promotion of wellness across the lifespan, including the medications commonly used to treat human disorders, their classification, mechanisms of actions, indications, contraindications/cautions, formulations, routes of metabolism and excretion, adverse reactions, and drug interactions. **Prerequisite: PAS 5161 and PAS 5261**

### **PAS 5371 EVIDENCE BASED PRACTICE-II (1 CREDIT)**

This is a continuation of the Evidence Based Practice I course. **Prerequisite: PAS 5171. (Pass/Fail)**

### **PAS 6015 CLINICAL PRACTICUM 1 (5 CREDITS)**

In the experiential phase, students are assigned into a series of rotations in a variety of settings. The Clinical Practicum are divided into 9 periods of approximately 5 weeks each. Required 5 week rotations include Family Medicine, Internal Medicine, Emergency Medicine and General Surgery. Experiences in Women's Health, Pediatrics and Behavioral Health are also required but tend to be briefer experiences that may be integrated throughout the clinical experiences. Elective rotations are available in a variety of clinical practice areas, pending preceptor availability. The Program reserves the right to assign rotations or supplemental activities to ensure that students meet all experiential phase Program requirements. **Prerequisites: Successful completion of all didactic phase courses.**

### **PAS 6025 CLINICAL PRACTICUM 2 (5 CREDITS)**

In the experiential phase, students are assigned into a series of rotations in a variety of settings. The Clinical Practicum are divided into 9 periods of approximately 5 weeks each. Required 5 week rotations include Family Medicine, Internal Medicine, Emergency Medicine and General Surgery. Experiences in Women's Health, Pediatrics and Behavioral Health are also required but tend to be briefer experiences that may be integrated throughout the clinical experiences. Elective rotations are available in a variety of clinical practice areas, pending preceptor availability. The Program reserves the right to assign rotations or supplemental activities to ensure that students meet all experiential phase Program requirements. **Prerequisites: Successful completion of all didactic phase courses.**

### **PAS 6035 CLINICAL PRACTICUM 3 (5 CREDITS)**

In the experiential phase, students are assigned into a series of rotations in a variety of settings. The Clinical Practicum are divided into 9 periods of approximately 5 weeks each. Required 5

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week rotations include Family Medicine, Internal Medicine, Emergency Medicine and General Surgery. Experiences in Women's Health, Pediatrics and Behavioral Health are also required but tend to be briefer experiences that may be integrated throughout the clinical experiences.

Elective rotations are available in a variety of clinical practice areas, pending preceptor availability. The Program reserves the right to assign rotations or supplemental activities to ensure that students meet all experiential phase Program requirements. **Prerequisites:**

**Successful completion of all didactic phase courses.**

### **PAS 6045 CLINICAL PRACTICUM 4 (5 CREDITS)**

In the experiential phase, students are assigned into a series of rotations in a variety of settings. The Clinical Practicum are divided into 9 periods of approximately 5 weeks each. Required 5 week rotations include Family Medicine, Internal Medicine, Emergency Medicine and General Surgery. Experiences in Women's Health, Pediatrics and Behavioral Health are also required but tend to be briefer experiences that may be integrated throughout the clinical experiences.

Elective rotations are available in a variety of clinical practice areas, pending preceptor availability. The Program reserves the right to assign rotations or supplemental activities to ensure that students meet all experiential phase Program requirements. **Prerequisites:**

**Successful completion of all didactic phase courses.**

### **PAS 6055 CLINICAL PRACTICUM 5 (5 CREDITS)**

In the experiential phase, students are assigned into a series of rotations in a variety of settings. The Clinical Practicum are divided into 9 periods of approximately 5 weeks each. Required 5 week rotations include Family Medicine, Internal Medicine, Emergency Medicine and General Surgery. Experiences in Women's Health, Pediatrics and Behavioral Health are also required but tend to be briefer experiences that may be integrated throughout the clinical experiences.

Elective rotations are available in a variety of clinical practice areas, pending preceptor availability. The Program reserves the right to assign rotations or supplemental activities to ensure that students meet all experiential phase Program requirements. **Prerequisites:**

**Successful completion of all didactic phase courses.**

### **PAS 6065 CLINICAL PRACTICUM 6 (5 CREDITS)**

In the experiential phase, students are assigned into a series of rotations in a variety of settings. The Clinical Practicum are divided into 9 periods of approximately 5 weeks each. Required 5 week rotations include Family Medicine, Internal Medicine, Emergency Medicine and General Surgery. Experiences in Women's Health, Pediatrics and Behavioral Health are also required but tend to be briefer experiences that may be integrated throughout the clinical experiences.

Elective rotations are available in a variety of clinical practice areas, pending preceptor availability. The Program reserves the right to assign rotations or supplemental activities to ensure that students meet all experiential phase Program requirements. **Prerequisites:**

**Successful completion of all didactic phase courses.**

### **PAS 6075 CLINICAL PRACTICUM 7 (5 CREDITS)**

In the experiential phase, students are assigned into a series of rotations in a variety of settings. The Clinical Practicum are divided into 9 periods of approximately 5 weeks each. Required 5 week rotations include Family Medicine, Internal Medicine, Emergency Medicine and General Surgery. Experiences in Women's Health, Pediatrics and Behavioral Health are also required but tend to be briefer experiences that may be integrated throughout the clinical experiences.

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Elective rotations are available in a variety of clinical practice areas, pending preceptor availability. The Program reserves the right to assign rotations or supplemental activities to ensure that students meet all experiential phase Program requirements. **Prerequisites: Successful completion of all didactic phase courses.**

### **PAS 6085 CLINICAL PRACTICUM 8 (5 CREDITS)**

In the experiential phase, students are assigned into a series of rotations in a variety of settings. The Clinical Practicum are divided into 9 periods of approximately 5 weeks each. Required 5 week rotations include Family Medicine, Internal Medicine, Emergency Medicine and General Surgery. Experiences in Women's Health, Pediatrics and Behavioral Health are also required but tend to be briefer experiences that may be integrated throughout the clinical experiences. Elective rotations are available in a variety of clinical practice areas, pending preceptor availability. The Program reserves the right to assign rotations or supplemental activities to ensure that students meet all experiential phase Program requirements. **Prerequisites: Successful completion of all didactic phase courses.**

### **PAS 6095 CLINICAL PRACTICUM 9 (5 CREDITS)**

In the experiential phase, students are assigned into a series of rotations in a variety of settings. The Clinical Practicum are divided into 9 periods of approximately 5 weeks each. Required 5 week rotations include Family Medicine, Internal Medicine, Emergency Medicine and General Surgery. Experiences in Women's Health, Pediatrics and Behavioral Health are also required but tend to be briefer experiences that may be integrated throughout the clinical experiences. Elective rotations are available in a variety of clinical practice areas, pending preceptor availability. The Program reserves the right to assign rotations or supplemental activities to ensure that students meet all experiential phase Program requirements. **Prerequisites: Successful completion of all didactic phase courses.**

### **PAS 6141 SENIOR SEMINAR I (1 CREDIT)**

This is the first of three Senior Seminar courses intertwined with the experiential phase of the PA Program. Over this course series, students will be exposed to a wide variety of topics pertinent to medical practice, including: healthcare policy and systems issues, medicolegal aspects of clinical practice, reimbursement issues, PA employment issues, patient safety and error reduction measures, and public health issues (e.g., mandatory reporting requirements, public health disease control measures). In addition, students will give case presentations of interesting patients they cared for on clinical practicums, and participate in activities designed to prepare them for the end-of-program summative exam and PANCE. **Prerequisite: Successful completion of all didactic phase courses. (Pass/Fail)**

### **PAS 6171 GRADUATE PROJECT I (1 CREDIT)**

This is the first in a series of three courses designed to build upon the previous Evidence Based Practice courses and provide students with experience in planning and implementing a primary research or clinical practice improvement project. Over the series of the Graduate Project courses, students actively participate in the research process by working in small groups to submit a formal research proposal, seek and obtain Institutional Review Board (IRB) approval, gather and analyze data, and properly communicate and defend findings in oral and written formats. By the conclusion of the Graduate Project I course, students are expected to complete a

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research proposal and apply for Institutional Review Board approval. **Prerequisite: Successful completion of all didactic phase courses. (Pass/Fail)**

### **PAS 6241 SENIOR SEMINAR II (1 CREDIT)**

This is a continuation of the three-course series of Senior Seminar. **Prerequisite: PAS 6141. (Pass/Fail)**

### **PAS 6271 GRADUATE PROJECT II (1 CREDIT)**

This is the second in a series of three Graduate Project courses. By the conclusion of the Graduate Project II course, students are expected to finalize data collection and begin the data analysis and interpretation sections of their scholarly project. **Prerequisite: 6171. (Pass/Fail)**

### **PAC 6341 SENIOR SEMINAR III (1 CREDIT)**

This is a continuation of the three-course series of Senior Seminar. **Prerequisite: PAS 6241. (Pass/Fail)**

### **PAS 6371 GRADUATE PROJECT III (1 CREDIT)**

This is the third in a series of three Graduate Project courses. By the conclusion of the Graduate Project III course, students are expected to complete their scholarly project and present and defend their findings before program faculty. **Prerequisite: PAS 6271. (Pass/Fail)**

## **PHYSICS**

### **PH 104/104L PHYSICAL SCIENCE & LABORATORY 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 154/154L COLLEGE PHYSICS I & LABORATORY 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 164/164L COLLEGE PHYSICS II & LABORATORY 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. **Prerequisite: PH 154**

### **PH 224/224L UNIVERSITY PHYSICS I & LABORATORY 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**



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### **PH 224H/224L HONORS UNIVERSITY PHYSICS I & LABORATORY 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 234/234L UNIVERSITY PHYSICS II & LABORATORY 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/234L HONORS UNIVERSITY PHYSICS II & LABORATORY 3-2-4**

Topics covered include oscillatory motion, wave motion, electrostatics, DC and AC circuits, magnetostatics, electromagnetism, and optics. Emphasis is on collaborative learning and inquiry as opposed to traditional lecture. Assignments include additional analysis, research methods. Students complete a research project. Experimental investigation of selected topics.

**Prerequisites: PH 224, MA 164 and admission to the Honors Program or permission of the instructor.**

### **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, magneto static 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**

## PLASTICS ENGINEERING TECHNOLOGY

### **PET 223 POLYMER STRUCTURES, PROPERTIES & 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.

### **PET 224 PLASTICS PROCESSING & 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. **Corequisite: 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 & 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. **Prerequisites: PET 223 or equivalent polymer science course; ETD 173 or EGR 143; and ETD 433**

## **POLITICAL SCIENCE** (Formerly Government – GOV)

### **POLS 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.

### **POLS 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: POLS 113**

**POLS 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. **(Same course as HIS 323) Prerequisites: POLS 113 or HIS 113**

**POLS 333 STATE AND LOCAL GOVERNMENT 3-0-3**

The general relationship between the states and the federal government; organization, functions, and divisions of authority between the executive, legislative and judicial. The functions, powers, and forms of county and municipal governments. **Prerequisite: POLS 113**

**POLS 343 AMERICAN POLITICAL THOUGHT 3-0-3**

A survey and analysis of significant political ideas from colonial times to present. Some of the ideas discussed in the survey include the philosophies of liberalism, conservatism, and pragmatism, as well as the political thinking of such men as Alexander Hamilton, Thomas Jefferson, John C. Calhoun, Henry Thoreau, Herbert Spencer and Lester Ward. **(Same course as HIS 343) Prerequisite: POLS 113**

**POLS 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. **(Same course as HIS 363) Prerequisites: HIS 113**

**POLS 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. **(Same course as PSY 373) Prerequisite: PSY 113 or POLS 113**

**POLS 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. **(Same course as HIS 403) Prerequisites: POLS 113**

**POLS 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. **(Same course as HIS 423) Prerequisite: HIS 113**

## 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 223 LIFE SPAN DEVELOPMENTAL PSYCHOLOGY 3-0-3**

An investigation into the developmental stages within the entire lifespan of a human being, from birth through adult development and old age, with emphasis on the origin of personality and factors related to intellectual growth. **Prerequisite: PSY 113**

### **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 course as SOC 343) Prerequisite: PSY 113**

**PSY 353 CHILD & 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 HUMAN BEHAVIOR & COUNSELING 3-0-3**

Examines the theory and practice of counseling with a corporate of social service setting Exposure to a variety of therapeutic techniques. Experience first-hand the complexities of the human mind through a case-study approach. Direct versus indirect forms of interventions are explored. **(Same course as SOC 363) Prerequisite: PSY 113**

**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 course as POLS 373) Prerequisites: POLS 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 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. **Prerequisite: (Same Course as MK 363) 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**

**Trine University**

**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 & 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 113**

**PSY 433 ISSUES OF SUBSTANCE ABUSE IN FAMILY SYSTEMS 3-0-3**

This course is required/needed for students who wish to sit for Licensed Addiction Counselor Exam, through Behavior Health and Human Service Licensing Board of Indiana. **Prerequisite: PSY 113**

**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**

**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 coursework in psychology. **Prerequisite: All required coursework in Psychology core**

**PSY 483 COUNSELING ISSUES IN SUBSTANCE ABUSE 3-0-3**

An examination of the special issues, populations, and treatment modalities specific to substance abuse counseling. Course can be used toward NAADAC certification for Addiction Professional in Training. **Prerequisite: PSY 113**

**PSY 493 ISSUES & ETHICS IN PSYCHOLOGY & COUNSELING 3-0-3**

Advanced level course provides an overview of legal and ethical aspects in the field of psychology and counseling with implications for the individual within the fields. Includes topics such as confidentiality, rights of clients, client records, equal protection for staff and clients, and discrimination. The American Psychological Association (APA) code of ethics and related codes are covered with an overview of ethical dimensions of practice. **Prerequisite: PSY 113**

**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 & 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, & 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 MSOL Program.**

## RESEARCH

### **RES 7003 RESEARCH INTRODUCTION: PROCESS & CONCEPTS 3-0-3**

This course provides an introduction for doctoral students to the research process. This course will revisit the foundations of research methodology providing students with a basic framework to critically evaluation social and behavioral science research. Students will be evaluated on their understanding and ability to apply the major concepts and methods of qualitative and quantitative research. This course will offer the student an experiential and conceptual future leadership research and upcoming research methods courses.

**RES 7033 MIXED METHODS RESEARCH: INTEGRATING QUALITATIVE & QUANTITATIVE APPROACHES 3-0-3**

This course will consider the theoretical and empirical aspects of research concerning human information, both in terms of individual behavior and social context. The course will address both the philosophical and methodological issues involved in research design, as well as the specific behavioral and situational issues that emerge in the sites of social action within leadership. Students will learn to conceptualize research problems, identify sources of data, assess treatment or intervention integrity, and measure constructs. Students will learn about the virtues and limitations of alternative research designs and strategies. Ethical and diversity issues (protection of human subjects, cultural and language issues) will be considered.

**RES 7043 RESEARCH CRITIQUES & DESIGN 3-0-3**

Critically analyzing literature, writing a literature review, writing requirements, and competencies. In developing the review, criteria are applied in analyzing and critiquing theoretical literature, critical analytic/review articles, qualitative and quantitative empirical studies, and specialized studies such as methodological, meta-analyses, and case studies. Following the analysis and critique, the review ends with a state-of-the-art discussion of the literature, which includes a synopsis, interpretations, theoretical and empirical conclusions, recommendations for future scholarly inquiry, and research strategies to address empirical recommendations. Effective writing, avoiding plagiarism, and adhering to APA style are emphasized.

**RES 7303 RESEARCH PROSPECTUS 3-0-3**

This course considers the theoretical and empirical aspects of research concerning human information, both in terms of individual behavior and social context. The course will address both the philosophical and methodological issues involved in research design, as well as the specific behavioral and situational issues that emerge in the sites of social action within Entrepreneurial Leadership. Students will learn to conceptualize research problems, identify sources of data, assess treatment or intervention integrity, and measure constructs. Students will learn about the virtues and limitations of alternative research designs and strategies. Ethical and diversity issues (protection of human subjects, cultural and language issues) will be considered. The primary focus will be on appropriate question design and development of a brief and prospectus in which they identify a research question or hypothesis relevant to information seeking based on a probative literature review and critique, and to formulate a research design that would adequately address the question.

**RES 7323 DISSERTATION RESEARCH TRACK 2 3-0-3**

This course will be completed when the student has successfully defended their Dissertation Proposal (Ch 1-3) and have been approved to conduct their original research.

**RES 7333 DISSERTATION DEFENSE 3-0-3**

This course will feature committee work in advising the final dissertation document. Successful defense of the completed dissertation is required to complete the course.



## SCIENCE

### **SCI 121 INTRODUCTION TO HEALTH PROFESSIONS 1-0-1**

This course is designed to help students interested in pre-health professional studies learn about various requirements and processes involved in the health profession of their choice. It will also highlight various services offered by Trine University to assist students as they pursue their professional goals. This course is intended for freshmen level students.

### **SCI 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: SCI 412, Senior standing**

### **SCI 434 SCIENCE INTERNSHIP (4 HRS.)**

An extended professional work experience in an area related to the student's major. The work experience consists of 200 documented work hours. **Prerequisite: Permission of Department Chair**

## SOCIAL INNOVATION

### **SI 213 THEORIES & PHILOSOPHIES OF SOCIAL INNOVATION 3-0-3**

Students are introduced to the altruistic and philanthropic drivers of social innovation, specifically focusing on how the desire to accrue value for society is becoming more influential than profit motive. The course asks students to examine (through a number of lenses) the emergence of the humanistic element in what have traditionally been capitalistic and technological fields. **(Same course as PHL 213) Prerequisites: ENG 103, PSY 113**

### **SI 403 SOCIAL INNOVATION PRACTICUM 3-0-3**

Students will learn and apply the steps that social entrepreneurs work through to operationalize social innovations and create social change: identifying a problem to address, developing a strategy to address the social need, fundraising, growing the organization, tracking results and maximizing impact. Students will develop a Theory of Change, Logic Model and Social Venture Plan for self-selected problem OR engage in a semester-long exploration of a social challenge or operational social innovation, with which they will actively engage during an Alternative Break Program (ABP) during Thanksgiving or Spring Break. **Prerequisites: SI/PHL 213, LDR 403, and**

pursuit of Social Innovation minor approved by academic advisor or permission of instructor.

## 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 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 & TECHNOLOGY 3-0-3**

An interdisciplinary effort to place modern technology within a social, cultural and historical context. **(Same course as PHL 333) Prerequisite: ENG113 or ENG 133**

### **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. **(Same course as PSY 343) Prerequisite: PSY 113**

### **SOC 363 HUMAN BEHAVIOR & COUNSELING 3-0-3**

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 course as PSY 363) Prerequisite: PSY 113**

## 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. *NATIVE SPEAKERS OF SPANISH MAY NOT REGISTER FOR SPN 103*

**SPN 113 SPANISH READING & WRITING I 3-0-3**

An introduction to the Spanish language that includes vocabulary development and the basics of grammar structure with an emphasis on reading and writing, as well as developing cultural insight into Hispanic countries. No previous study of Spanish is required.

**SPN 123 SPANISH II 3-0-3**

A continuation of the first semester of language (SPN 113), the focus of this second semester of beginning Spanish is to continue the development of listening, speaking, reading, and writing skills. Latin American and Spanish cultures are covered to provide a cultural insight in the target language. **Prerequisite: SPN 113 or by placement**

**SPN 203 SPANISH III 3-0-3**

An intermediate Spanish class with an emphasis on reading and writing skills which includes vocabulary and grammar instruction. Students explore Hispanic cultures with readings and videos based on historical, as well as current events to develop an understanding of the Hispanic world. Students analyze authentic literary selections with an expanded working vocabulary and write Spanish compositions with improved creative expression. Communicative skills are also emphasized through personal reflections and discussions with peers. **Prerequisite: SPN 123 or by placement**

**SPN 213 SPANISH IV 3-0-3**

A continuation of Spanish III, with an emphasis on reading comprehension of more complex texts, such as prose, fiction and articles. In addition, students will improve writing fluency and accuracy in essays in Spanish. The difficulty level of the reading selections increases in this course.

**Prerequisite: SPN 203**

**SPN 303 SPANISH LANGUAGE 3-0-3**

Review of vocabulary and Spanish grammar essentials with analysis and discussion of literary texts and videos through extensive reading and writing activities as well as oral presentations and class discussions. **Prerequisites: SPN 213**

**SPN 313 SPANISH WRITING & COMPOSITION 3-0-3**

This course emphasizes the development of writing skills and critical reading with Spanish compositions in comparative essay, the argumentative essay as well as academic and research papers. **Prerequisite: SPN 213**

**SPN 323 SPANISH CULTURE 3-0-3**

Introduction to popular culture and diversity in the Spanish-speaking world and the historical, political, economic and social aspects through interdisciplinary readings, videos, as well as material published on the internet to develop critical understanding and appreciation of a variety of Hispanic cultures. **Prerequisites: SPN 213**

## SOFTWARE ENGINEERING

### **SE 153 CLIENT-SIDE DATABASES 3-0-3**

An introduction to the implementation and theory of databases. Students will be able to implement a SQL/relational database; employ data model and entity-relationship models; analyze and correct redundancy; apply relational algebra; analyze a system or situation with respect to data integrity; explain and manipulate semi-structured data (e.g. XML). **Prerequisite: One application-programming course. / Corequisite: MA 113 College Algebra or higher.**

### **SE 221 INTRODUCTION TO GAME DESIGN 1-0-1**

This course introduces students to the practice and processes needed in game design. Students are familiarized with methods, theory and techniques of the design process in the Windows API environment. The game loop, graphics and animation, sound, collision detection, device input, game engines, and scripting are covered. A playable game that uses the concepts covered will be created in the final project.

### **SE 233 SYSTEMS PROGRAMMING 3-0-3**

Proficient use of operating systems, as a programmer and at the command line. Topics include shell scripting and tools like *awk*; version control and make/build tools; processes, threads, and concurrency; network/socket programming; memory allocation. Students will be able to use scripts to merge and to divide files based on content; to modify and apply Makefiles or equivalents; to write (small) distributed applications. **Prerequisite: CS 1123**

### **SE 303 SERVER-SIDE DATABASE 3-0-3**

Internet applications often use databases on remote serves. These are sometimes distributed, large, and non-relational, and they pose some difficulties. Students will develop and test a database with multiple serves, using PHP or similar tool to offer good data; will assure access security; identify and justify methods of backup/recovery; explain consistency, availability, and partitioning, and the limits of these; exploit a non-relational database; develop a database that operates effectively without assurance of consistency. **Prerequisite: SE 153, SE 233**

### **SE 353 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. (Same as CS 2503) **Prerequisite: CS 1123**

### **SE 383 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 security protocols in applications; discuss internet privacy and ethical issues; apply security concepts, technologies and best practices to develop secure applications. **Prerequisite: CS 1123**

### **SE 393 SOFTWARE PATTERNS & TEAM DEVELOPMENT 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 or SE 353**

## **SPEECH**

### **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 or COM 213**

## **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 & 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 313 PRINCIPLES OF SPORT & RECREATION MANAGEMENT 3-0-3**

A study of the management, marketing, financial and legal principles within a sports and recreation operation and the primary components and support structures of the industry. The purpose is to examine and gain an understanding of all facets of running a team or sporting organization. A significant research project will be due at the end of the course.

### **SM 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.

### **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**

## Trine University

### **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: Sport Management Major**

### **SM 412 BUSINESS PLANNING IN SPORT & RECREATION 2-0-2**

The creation of a business plan for a sport/recreation operation. **Prerequisite: MGT 303**

### **SM 413 ORGANIZATION & ADMINISTRATION OF PHYSICAL EDUCATION & ATHLETICS 3-0-3**

Theories establishing the procedures for facility, curriculum and faculty development in physical education and athletics are examined.

### **SM 416 INTERNSHIP IN SPORT MANAGEMENT (6 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**

### **SM 423 CAPSTONE EXPERIENCE IN SPORT MANAGEMENT 3-0-3**

The culminating final project of a Sport Management major. With the guidance of a professor the student will research a topic related to sports 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.

### **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 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.

### **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 & 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 & 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 & 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 MSOL Program.**

## STUDY ABROAD

### SA 2012 STUDY ABROAD EXPERIENCE 0-0-12

Trine offers three separate study abroad programs. You can enroll in semester, year-long, or summer programs through our partner providers. While enrolled in this course, a student is considered a full-time Trine University student.

## SURGICAL TECHNOLOGY

### SUR 104 INTRODUCTION TO SURGICAL TECHNOLOGY (4 HRS.)

This course prepares students to apply knowledge of the surgical technologist roles and responsibilities, professional relationships, and the psychological needs of the surgical patient; emphasis is placed on the operating environment. This course prepares the students to apply knowledge of safety in the workplace and basic safety techniques; including how to create and maintain a safe working environment. This course teaches aseptic procedures with emphasis placed on safety and division of duties when establishing a sterile field, scrubbing and donning of surgical attire, and gowning and gloving other team members. This course prepares students to apply knowledge of anatomy and physiology, surgical instruments, sutures, needles, sponges, drugs used during surgery, and dressings. Prepares students to apply knowledge of drainage systems and tubing, syringes and hypodermic needles, sponges and instruments counts.

### SUR 114 CLINICAL EXPERIENCE I (4 HRS.)

This course provides with knowledge of basic principles and practices involving hazards, laws, and ethics related to the field of surgical technology. It teaches laws and regulations, documentation and consents, and identifies potential hazards and safety precautions utilized in the operative environment. In addition, quality and end of life ethical issues are presented with emphasis on the biopsychosocial needs of the patient. This course also provides the surgical technology student with an overview of surgical services and various associated departments with observation and hands-on experience relevant to the surgical patients' care.

### SUR 124 CLINICAL EXPERIENCE II (4 HRS.)

This course provides students with actual on-the-job learning opportunities. It is conducted in surgical facilities and provides students a clinical experience with a variety of pre-, intra-, and post-operative assignments. Students will have opportunities to observe and assist in associated departments (L&D, endoscopy, and SPD). IN the operating room, the course will consist of the student in the observation role with transition to the second scrub and first scrub roles.

**Prerequisites: SUR 104 and SUR 114**

### SUR 134 SURGICAL PROCEDURE I (4 HRS.)

This course prepares students to think about procedures in a style similar to that of the surgeon. It is constructed in such a way as to teach basic surgical anatomy, instrumentation and procedural steps. The course introduces students to diagnostic procedures, endoscopic surgery and robotics, general obstetrics and gynecology, and genitourinary surgeries. **Prerequisite: SUR 104 and SUR 114**



## Trine University

### **SUR 218 CLINICAL EXPERIENCE III (8 HRS.)**

This course provides students with actual on-the-job learning opportunities. It is conducted in a surgical facility and provides students with a clinical experience with a variety of pre-, intra-, and post-operative assignments. Students will have opportunities to observe and assist in associated departments (L&D, OB, endoscopy, interventional radiology, SPD). The course will consist of second scrubbing with the transition to first scrubbing. **Prerequisite: SUR 124 and SUR 134**

### **SUR 223 CAPSTONE FOR THE SURGICAL TECHNOLOGIST (3 HRS.)**

This course is designed to provide a comprehensive review and knowledge assessment in preparation for taking a national credentialing exam. The course will also include an opportunity for the evaluation of skills, professional development, and critical thinking skills through case studies reflecting experiences often encountered during surgical technology clinical experience and in the surgical work environment. **Prerequisite: SUR 218 and SUR 234**

### **SUR 228 CLINICAL EXPERIENCE IV (8 HRS.)**

This course provides students with actual on-the-job learning opportunities. It is conducted in a surgical facility and provides students a clinical experience with a variety of pre-, intra-, and post-operative assignments. Emphasis is placed on the scrub and circulating roles of the surgical technologist including aseptic technique and basic surgical procedures while working as a member of the surgical team. **Prerequisites: SUR 218 and SUR 234**

### **SUR 234 SURGICAL PROCEDURES II (4 HRS.)**

This course prepares students to think about procedures in a style similar to that of the surgeon. It is constructed in such a way as to teach basic surgical anatomy, instrumentation and procedural steps. The course introduces students to general surgical techniques involved during orthopedic, cardiothoracic, peripheral vascular, and neurosurgeries. **Prerequisites: SUR 124 and SUR 134**

### **SUR 244 SURGICAL PROCEDURES III (4 HRS.)**

This course prepares students to think about procedures in a style similar to that of the surgeon. It is constructed in such a way as to teach basic surgical anatomy, instrumentation and procedural steps. The course introduces students to otorhinolaryngologic surgeries, ophthalmic surgeries, oral and maxillofacial, and plastics and reconstruction surgeries. **Prerequisites: SUR 218 and SUR 234**

## **THEATRE**

### **THE 100 THEATRE PRODUCTION (*non-credit*) 0-2-0**

Improvement of skills in theatrical production in conjunction with Trine University's Drama Club, including but not limited to acting, directing, technical theatre, or front-of-house experiences. This course is open to all students. This course is graded on a satisfactory/unsatisfactory basis.

### **THE 101 THEATRE PRODUCTION 0-2-1**

Improvement of skills in theatrical production in conjunction with Trine University's Drama Club, including but not limited to acting, directing, technical theatre, or front-of-house experiences. This course is open to all students. This course is graded on a satisfactory/unsatisfactory basis.

### **THE 103 INTRODUCTION TO THEATRE 3-0-3**

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.

## **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 101 UNIVERSITY EXPERIENCE 1-0-1 (PASS/FAIL grading system)**

This course offers resources for success in learning for students new to Trine University. This course will assist students in becoming more proficient learners, understanding self and others, and learning personal life skills. This course will present information about Trine University offices and services to familiarize students with resources and procedures.

### **UE 103 THE FIRST YEAR SEMINAR 1-0-3**

The First-Year Seminar course provides students with the opportunity to engage with a particular topic, a professor, and their peers. This course will focus on a subject of mutual interest and is designed to assist students in their academic and social development and in their transition to college.

### **UE 111 ONLINE LEARNING ORIENTATION 1-0-1**

This course offers resources for success in learning for students new to Trine University. This course will assist new students in becoming acclimated to the university, and identifying the expectations of a Trine University student while providing them to opportunity to become familiar with the course management system (Moodle). This course will also present information about Trine University offices and services to familiarize students with resources and procedures. **This is a four week course.**

### **UE 121 INTERNATIONAL LEARNING ORIENTATION (1 CR) (PASS/FAIL grading system)**

This course offers resources for success in learning for international students new to Trine University. This course will assist new international students in becoming acclimated to the university, and understanding expectations as a Trine University learner while allowing them to become familiar with the course management system (Moodle). This course will also present information about Trine University offices and services to familiarize students with resources and procedures. **This is a four week course.**

### **UE 200 ACADEMIC COACHING (0 CR) (PASS/FAIL grading system)**

This course provides an opportunity to build and reflect on college success skills with the assistance of an academic coach. It is required for students on academic probation.

**UEI 141 / 141L PARALINGUISTICS OF ENGLISH CONVERSATION**

This course helps non-native English-speaking students improve and build confidence in their English-speaking skills. Students gain the ability to engage fully in academic discussion and informal conversations through focused pronunciation practice and active participation in structured conversation activities. Students analyze the verbal and non-verbal tools as well as the cultural cues utilized in American English discourse. **Corequisite: UEI 141L**

**UEI 191 / 191L ADJUSTING TO U.S. CAMPUS LIFE**

First-year international students learn about subjective cultural aspects of American university campuses, such as the American work ethic, the concept of time, and how to make a good first impression. In turn, students present their own cultures to other students and professors. They actively participate in conversations about other cultural values, campus life, and aspects of being a student here at Trine University. They learn about rules, laws, and policies, both on campus and in the local community, and they practice reacting to various emergency situations. They internalize important vocabulary to assist them in adjusting to life on an American university campus, and they learn to recognize the stages of culture shock and some strategies of coping with it. This course requires a lab portion that must be taken concurrently.

**Corequisite: UEI 191L**

## **WOMEN'S STUDIES**

**WS 103 INTRODUCTION TO WOMEN'S STUDIES 1-0-3**

Introduction to Women's Studies offers an interdisciplinary exploration of the psycho-sociological construction of a woman's gender identity. It analyzes the historical progression of gender roles and feminist theory through a confluence of social, cultural, economic, political, geographic, and institutional pressures. The course examines how these components intersect in order to define what it is to be a woman in contemporary times. **Prerequisite: ENG 103**

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

**\*\*All Graduate classes, regardless of format, follow the 8-week Face to Face summer schedule**

**Fall Semester 2019**

August 19	Classes begin
August 26	Last day to drop a course at 100% refund Last day to add a course
September 2	Labor Day (no classes)
September 9	Last day to drop a semester long course at 50% refund
October 2	Last day to drop a Term 1 course – no refund
October 10	Midterm Grades due from faculty by midnight
October 11	Midterm Grade Reports posted and mailed to first-year students
October 12	Term 1 ends
October 14-15	Fall Break (no classes)
October 21	Term 2 begins
October 28	Last day to drop a Term 2 course at 100% refund Last day to add a Term 2 course
November 13	Last day to drop a semester long course – no refund
November 27-29	Thanksgiving break (no classes)
December 4	Last day to drop a Term 2 course – no refund
December 6	Last class day
December 9-14	Finals Week
December 14	Fall Semester Ends

**Spring Semester 2020**

January 6	Classes begin
January 13	Last day to drop a course at 100% refund Last day to add a course
January 20	Martin Luther King Jr. Day (no classes)
January 27	Last day to drop a semester long course at 50% refund
February 19	Last day to drop a Term 1 course – no refund
February 27	Midterm Grades due from faculty by midnight
February 28	Midterm Grade Reports posted and mailed to first-year students
February 29	Term 1 ends
March 2-6	Spring Break (no classes)
March 9	Term 2 begins
March 16	Last day to drop a Term 2 course at 100% refund Last day to add a Term 2 course
April 8	Last day to drop a semester long course – no refund
April 10	Good Friday (no classes)
April 22	Last day to drop a Term 2 course – no refund
April 24	Last class day
April 27 – May 2	Finals Week
May 2	Spring Semester Ends
May 2	Commencement

**Trine University**

**Summer Semester 2020**

May 11	Classes begin- 12-Week, First 6-Weeks, Term 1 – Online (OL)
May 15	Last day to drop a course at 100% refund Last day to add a course
May 25	Memorial Day (no classes)
June 12	Last day to drop a course (First 6-Weeks) – no refund
June 18	Last Class Day - First 6-Weeks
June 19	Finals – First 6-Weeks No 12-Week Classes
June 20	Term 1 ends - OL
June 22	Classes begin -Second 6-Weeks, Term 2 OL
June 26	Last day to drop a course at 100% refund (Second 6-Weeks)
July 3	July 4 <sup>th</sup> Holiday (no classes)
July 17	Last day to drop a course (12-Week) – no refund
July 24	Last day to drop a course (Second 6-Weeks) – no refund
July 30	Last Class Day – 12-Week and Second 6-Weeks
July 31 - August 1	Finals -12-Week and Second 6-Weeks
August 2	Term 2 ends - OL
August 2	Summer Semester Ends

## **BOARD OF TRUSTEES**

Year in parentheses denotes when affiliation with board began.

### **OFFICERS:**

Rick L. James (2010) *Chair*

Fort Wayne, Indiana

B.S.B.A. (Tri-State University); Hon. DBA (Trine University);

Chairman/CEO, Metal Technologies, Inc., Auburn, Indiana

Jack Shaw (2010) *Vice Chair*

Coldwater, Michigan

B.S.E.E. (Purdue University)

President and CEO (ret.) Hughes Electronics Corp., Coldwater, Michigan

Lynn A. Brooks (2007) *Secretary*

Auburn, Indiana

B.S.B.A. (Tri-State University)

President and CEO (ret.), Rieke Corporation, Auburn, Indiana

### **MEMBERS:**

Jerry L. Allen (1995)

*Chair Emeritus Board of Trustees*

Westfield Center, Ohio

B.S.M.E., Hon. D.E. (Tri-State University)

President, Conduit Space Recovery Systems, LLC

Sarasota, Florida

James D. Bock (2003)

Elkhart, Indiana

B.S.M.E. (Tri-State University);

President/Owner (ret.) Bock Engineering Co., Elkhart, Indiana

Keith E. Busse (2003)

Fort Wayne, Indiana

B.S.B.A. (University of Saint Francis); M.B.A. (Indiana-Purdue University Fort Wayne);

Hon. DBA (University of Saint Francis); Hon. DBA (Trine University)

Chairman, Board of Directors Steel Dynamics, Inc., Fort Wayne, Indiana

Trine University

Jeanice Croy (2017)  
Fort Wayne, Indiana  
B.S.Acc. (University of Kentucky)  
Co-owner, Fleet Feet Sports, Fort Wayne, Indiana

Michael J. Eikenberry (2014)  
Fort Wayne, Indiana  
B.S.B.A. (Ball State University) (Retired),  
President (ret.) PNC Bank, Fort Wayne, Indiana

James P. Fabiani (2001)  
*Vice Chair Emeritus Board of Trustees*  
McLean, Virginia  
B.S. (Harvard); M.Ed. (University of Massachusetts);  
Chair and CEO, Fabiani & Company, Washington, DC

Lawrence A. Franks (1984-2002) (2004)  
*Chair Emeritus Board of Trustees*  
Sturgis, Michigan  
B.S.M.E., Hon. D.E. (Tri-State University)  
President (ret.) Burr Oak Tool, Inc., Sturgis, Michigan

Tomas Furth (1997)  
New York, New York  
B.S.M.E., B.S.Ch.E., Hon. D.E. (Tri-State University)  
President, Sudamtex Holding, Caracas, Venezuela

William A. Gettig (1984)  
*Chair Emeritus Board of Trustees*  
Spring Mills, Pennsylvania  
B.S.M.E., Hon. D.E. (Tri-State University); Hon. Doctor of Laws,  
(Susquehanna University)  
President and C.E.O., Gettig Technologies Inc, Spring Mills, Pennsylvania

Timothy J. Haffner (2016)  
Fort Wayne, Indiana  
B.A. (Wabash College)  
J.D. (Indiana University Maurer School of Law)  
Partner, The Law Firm of Faegre Baker Daniels, Fort Wayne, Indiana

## Trine University

Rick Henvey (2017)

Fort Wayne, Indiana

B.S.B.A., M.S. (Southern Nazarene University)

Chief Operating Officer, Parkview Health, Fort Wayne, Indiana

Senator Dennis Kruse (2010)

Auburn, Indiana

B.S., GRI and CAI (Indiana University)

Indiana State Senator, Indianapolis, Indiana

Stephen R. LaHood (2004-2010, 2014)

Sarasota Florida

B.S.B.A. (Tri-State University)

President/Owner (ret.) Senior Vice-President, Operations PartyLite, Sarasota Florida

Richard L. Oeder (1995)

Morrow, Ohio

B.S.C.E. (Tri-State University)

Area Manager (ret.), Columbia Gas of Ohio, Springfield, Ohio

Derek S. Reiners (2017)

Tulsa, Oklahoma

B.S.B.A., M.Acc. (Oklahoma State University)

Senior Vice President, Finance and Treasurer, ONEOK, Inc., Tulsa, Oklahoma

Larry E. Reiners (2009)

Tulsa, Oklahoma

B.S.C.E. (Tri-State University)

Manager, ISTI Plant Services, Catoosa, Oklahoma

Mitchel E. Rhoads (2006)

Longboat Key, Florida

B.S.B.A. (Tri-State University)

Chairman, Rhoads Holding, Ltd., Longboat Key, Florida

Elizabeth F. Rooney (2014)

New York, New York

B.A.S. (Boston College)

Product Marketing Manager, Google Inc., New York, New York



## Trine University

Clifford D. Ryan (2009)

Naples, Florida

B.S.B.A. (Tri-State College)

Manager, R. & R. Real Estate, Ltd., Naples, Florida

Ralph D. Trine (1990)

Fremont, Indiana

B.S.M.E., Hon. D.E. (Tri-State University)

M.S.M.E., M.B.A. (Michigan State University)

Chair and CEO, Vestil Manufacturing Co., Angola, Indiana

Sheri Trine (2007)

Fremont, Indiana

Hon. D.H.L. (Tri-State University)

Executive Vice President, Vestil Manufacturing Co., Angola, Indiana

Keith M. Turner (2014)

Angola, Indiana

B.S.M.E. (Tri-State University); M.S.B.A. (Indiana University)

Cofounder (ret.) Metal Technologies Group, Auburn, Indiana

Theresa E. Wagler (2011)

Fort Wayne, Indiana

B.A. (Taylor University)

Executive Vice President and CFO Steel Dynamics, Inc. Fort Wayne, Indiana

R. Wyatt Weaver (2004)

Angola, Indiana

B.S. and M.D. (Indiana University)

Parkview Physician's Group, Angola, Indiana

## TRUSTEES EMERITI

(Dates denote years of active service as a trustee.)

Jimmie Caldwell (1976-2009) *Chair Emeritus*

Indianapolis, Indiana

B.S.C.E., Hon. D.E. (Tri-State University)

Registered Professional Engineer

President and Chair (ret.), Chair Emeritus, Geiger and Peters, Inc.,

Indianapolis, Indiana

Louis L. Holtz (2011-2017)

Orlando, Florida

B.S. (Kent State University); M.S. (University of Iowa)

Honorary Degrees (Trine University, University of Notre Dame, Kent State University, Gonzaga University, Benedictine University, and Wingate University)

ESPN Sports Analyst (ret.)

Hall of Fame Collegiate Football Coach

Orlando, Florida

Paul R. Kahlenbeck (1983-1998) *Chair Emeritus*

Columbus, Indiana

B.S.M.E., Hon. D.E. (Tri-State University)

Vice President (ret.), Cummins Engine Company, Inc., Columbus, Indiana

John W. Kirsch (1965-1975)

Sturgis, Michigan

Ed. (Albion College); M.B.A. (Indiana University);

Chair of the Board (ret.), Kirsch Company, Sturgis, Michigan

John J. McKetta, Jr. (1957-2011)

Austin, Texas

B.S.Ch.E., Hon. D.E. (Tri-State University); B.S.E., M.S., Ph.D. (University of Michigan); Hon. D.Sc. (University of Toledo); Hon. D.E. (Drexel University);

Registered Professional Engineer

Joe C. Walter Chair in Chemical Engineering (Emeritus), Department of Chemical Engineering, University of Texas, Austin, Texas

## Trine University

John A. Pittman (1997-2015) *Chair Emeritus*

Austin, Texas

B.S.E.E., Hon. D.E. (Tri-State University); M.B.A. (Baldwin-Wallace College)

President (ret.), The Fieldbus Foundation, Austin, Texas

Gary L. Ray (1990-2002) *Chair Emeritus*

Medina, Ohio

B.S.M.E., Hon. D.E. (Tri-State University); M.B.A. (Wharton Graduate Division, University of Pennsylvania);

President/Owner, Transformer Engineering Corp., Cleveland, Ohio

Richard A. Rosenthal (1971-1977)

Niles, Michigan

B.S. (University of Notre Dame);

Director of Athletics, University of Notre Dame, South Bend, Indiana

## FACULTY

*Year in parentheses denotes when employment with Trine University began.*

Susan Anspaugh (2005)

Associate Professor, Department of Exercise Science

Rinker-Ross School of Health Sciences

B.S., M.S. (Memphis State University); Ph.D. (University of Mississippi)

Matthew Austin (2017)

Assistant Professor, Physical Therapy Assistant

B.A. (Michigan State University); DPT (University of St. Augustine for Health Sciences)

William Barge (2002)

Associate Professor, Department of Computer Science & Information Technology

Allen School of Engineering and Computing

B.S. (Miami University); M.B.A. (Indiana University),

M.S. (Regis University); Ph.D. (Indiana State University)

William Barry (2008) *Department Chair*

Associate Professor, Reiners Department of Civil & Environmental Engineering

John G. & Virginia C. Stemples Professor in Engineering

Allen School of Engineering and Computing

B.S. (Carnegie Mellon University); M.S. (Stanford University); Ph.D. (Carnegie Mellon University)

Brett Batson (2006)

Professor, Wade Department of Mechanical & Aerospace Engineering

Allen School of Engineering and Computing

B.S., M.S., Ph.D. (Iowa State University)

Max Baumgartner (2013) *Dean Graduate Programs, Rinker-Ross School of Health Sciences*

Professor, Doctor of Physical Therapy

B.A. (University of Toledo); B.S. (University of Toledo/Medical College of Ohio); P.T. (University of

St. Augustine); Ph.D. (Nova Southeastern University); O.C.S.; F.A.A.O.M.P.T.

Cassandra Bausman (2015)

Assistant Professor, Department of Humanities & Communication

Jannen School of Arts & Sciences

B.A. (Augustana College); M.A., Ph.D. (University of Iowa)

Catherine Benson (2012) *Dean, Ketner School of Business & Director of Golf Management*

Assistant Professor, Ketner School of Business

Rick L. & Vicki L. James Dean's Chair in Ketner School of Business

B.A. (Transylvania University); P.G.A. Certification; M.S.L. (Trine University)

## Trine University

Angela Berger (2018)

Assistant Professor, Department of Science  
Rinker-Ross School of Health Sciences  
B.S. (Michigan State University); Ph.D. (Indiana University)

Michael Biegas (2005)

Associate Professor, Department of Psychology & Social Sciences  
Jannen School of Arts & Sciences  
B.A. (Tri-State University); M.A. (Michigan State University)

Michelle Blank (2016) *Director of Information Services, Main Campus*

Instructor, Information Services, Academic Success Center  
B.A. (Goshen College); M.L.I.S. (University of Alabama); MA.E. (Defiance College)

Michael Blaz (1976) *Department Chair*

Professor, Department of Psychology, & Social Sciences  
Jannen School of Arts & Sciences  
B.A. (University of Minnesota); M.A. (Illinois State University); Ph.D. (University of Kentucky)

Justin Bock (2016)

Assistant Professor, Franks School of Education  
Franks School of Education  
B.S. (Taylor University); M.Ed. (Indiana Wesleyan University)

Angela Bojrab (2014)

Associate Professor, Department of Science  
Rinker-Ross School of Health Sciences  
A.S., B.S., (Purdue University); D.P.M. (Ohio College of Podiatric Medicine and Catholic Health System, Sisters of Charity Hospital Podiatric Medicine and Surgery)

Ana Boman (2015)

Lecturer, Department of Humanities & Communications  
Jannen School of Arts & Sciences  
B.A., M.A. (Indiana Purdue Fort Wayne); M.A. (Universidad de Valladolid)

Byron Bond (2018)

Associate Professor, Department of Humanities and Communication  
Jannen School of Arts & Sciences  
B.A., M.A. (Kalamazoo College)

Jacob Borden (2019)

Associate Professor, Department of Chemical & Bioprocess Engineering  
B.S. (Rose-Hulman Institute of Technology); M.S. (Auburn University); M.B.A. (Spring Hill College); Ph.D. (Northwestern University)

## Trine University

Kristina Brewer (2004) *Director of Information Services, Carew Campus*  
Instructor  
Information Services, Carew Street Campus  
B.A. (Western Michigan University); M.L.I.S. (University of Michigan)

Earl D. Brooks, II (2000) *President*  
Professor, Science  
B.S., M.S., Ph.D. (University of Tennessee)

Greg Brooks (2015)  
Assistant Professor, Ketner School of Business  
B.S. (Ball State University); MBA (Saint Francis University)

Andrew Brown (2019)  
Assistant Professor, Department of Humanities & Communication  
Jannen School of Arts & Sciences  
B.S. (Hillsdale College); M.A. (Western Michigan University)

Daniel Buehrer (2015)  
Instructor & Lab Technician, Department of Science  
Rinker-Ross School of Health Sciences  
B.S. (Tri-State University)

James Canino (2010)  
Associate Professor, Wade Department of Mechanical & Aerospace Engineering  
Allen School of Engineering and Computing  
B.S. (Milwaukee School of Engineering); M.S., Ph.D. (Purdue University)

Stephen Carr (2003)  
Associate Professor, Department of Electrical & Computer Engineering  
Allen School of Engineering and Computing  
B.S. (University of Ulster); Ph.D. (Queens University of Belfast)

Sean Carroll (1990) *Associate Dean the College of Engineering & Business & Department Chair*  
Professor, Department of Electrical & Computer Engineering  
Allen School of Engineering and Computing  
B.E. (Vanderbilt University); M.S.E., Ph.D. (Princeton University)

Paul Cervone (2018)  
Assistant Professor/Medical Director, Physician Assistant Studies  
Rinker-Ross School of Health Sciences  
B.A. (University of Pennsylvania); M.P.S. (Penn State); M.D. (University of Pittsburgh)

## Trine University

Gurudutt Chandrashekar (2018)

Assistant Professor, Wade Department of Mechanical & Aerospace Engineering

Allen School of Engineering and Computing

B.S. (Rashtreeya Vidyalaya College of Engineering); M.S. (Ruhr University of Bochum); Ph.D. (University of Wyoming)

Linda Conley (2010) *KSB Director of Accreditation for ACBSP*

Assistant Professor, Ketner School of Business

B.S.B.A., M.O.D. (Bowling Green State University)

Charles Copeland (2018)

Assistant Professor, Physician Assistant Studies

B.S. (Purdue University); B.S., P.A. (University of Nebraska)

Amanda Davis (2017)

Assistant Professor, Department of Exercise Science

Rinker-Ross School of Health Sciences

B.S. (University of Indianapolis); M.S. (Des Moines University)

Lauren Decker (2014)

Instructor, Department of Mathematics & Physics

Jannen School of Arts & Sciences

B.S. (Indiana-Purdue University); M.A. (Western Governors University)

Jacqueline Delagrange (2015) *Department Chair*

Assistant Professor, Department of Criminal Justice

Jannen School of Arts & Sciences

B.S. (Trine University); M.S. (Trine University); J.D. (Western Michigan University Thomas M. Cooley Law School)

Brandy DePriest (2007)

Assistant Professor, Department of Humanities & Communication

Jannen School of Arts & Sciences

B.A. (University of Louisville); M.A. (Xavier University); Ph.D. (Indiana Institute of Technology)

Daniel Dobbs (2016)

Assistant Professor, Department of Mathematics & Physics

Jannen School of Arts & Sciences

B.A. (Northwestern College); M.S. (University of Wyoming); M.S. (University of Nebraska);

Ph.D. (University of Virginia)

Ryan Dombkowski (2014)

Professor, Doctor of Physical Therapy

Rinker-Ross School of Health Sciences

B.A. (Wabash College); Ph.D. (University of Notre Dame)

## Trine University

Samuel Drerup (2016)

Assistant Professor, Department of Science

Rinker-Ross School of Health Sciences

B.S. (Ohio University); M.S. (Wright State University); Ph.D. (Ohio University)

Steven Dulaney (2013)

Assistant Professor, Department of Science

Rinker-Ross School of Health Sciences

B.A. (Adrian College); Ph.D. (Michigan State)

Martin Dygert (2017)

Lecturer, Department of Mathematics and Physics

Jannen School of Arts & Sciences

Nicole Edmond (2019)

Assistant Professor, Doctor of Physical Therapy Program

Rinker-Ross School of Health Sciences

B.S. (Ball State University); D.P.T. (Grand Valley State University)

Jenna L. Encheff, P.T., Ph.D. (2015)

Associate Professor, Doctor of Physical Therapy Program

Rinker-Ross School of Health Sciences

B.S., M.S., P.T., Ph.D. (The University of Toledo)

Tennille Fenstermaker (2018)

Lecturer, Department of Humanities & Communication

Jannen School of Arts & Sciences

B.S. (Tri-State University); M.S. (Arizona State University)

Jacob Finnerman (2019)

Assistant Professor, Department of Design Engineering & Technology

Allen School of Engineering and Computing

B.S. (Trine University)

Marissa Ford (2018) *Department Chair*

Assistant Professor, Department of Mathematics & Physics

Jannen School of Arts & Sciences

B.S. (Millikin University); M.A. (Eastern Illinois University)

Sarah Franzen (2009) *Assistant Vice Pres. of Accreditation, Dean, Jannen School of Arts & Sciences*

Associate Professor, Department of Humanities & Communication

Jannen School of Arts & Sciences

B.A., M.S. (Indiana University); Ph.D. (University of Indiana of Pennsylvania)



## Trine University

Roberta Gagnon (2017)

Assistant Professor, Department of Design Engineering Technology  
Allen School of Engineering and Computing  
B.S. (University of Toledo); M.B.A. (Florida Institute of Technology)

Maria Gerschutz (2013) *Department Chair*

Associate Professor, Department of Biomedical Engineering  
Allen School of Engineering and Computing  
B.S., M.S., Ph.D. (Wright State University)

Eric Goddard (2017)

Lecturer, Department of Psychology & Social Sciences  
Jannen School of Arts & Sciences  
B.A. (Taylor University); M.A., Ph.D. (University of Wisconsin)

Jeanette Goddard (2016) *Department Chair*

Assistant Professor, Department of Humanities & Communication  
Jannen School of Arts & Sciences  
B.A. (Calvin College); M.A., Ph.D. (University of Wisconsin)

Max Gong (2019)

Assistant Professor, Department of Biomedical Engineering  
Allen School of Engineering and Computing  
B.A.Sc., Ph.D. (University of Toronto); M.A. Sc. (University of Guelph)

Gary Greene (2013)

Associate Professor, Reiners Department of Civil & Environmental Engineering  
William & Patricia Schantz Professorship in Civil Engineering  
Allen School of Engineering and Computing  
B.S., M.S. Ph.D. (Missouri University of Science & Technology) P.E.

Jennifer Griggs (2017)

Instructor, Academic Services  
B.S. (Tri-State University)

Kevin Hamman (2019) *Director of MSIS*

Allen School of Engineering and Computing  
B.S. (Purdue University); M.S. (DeVry University)

Brittni Heiden (2019) *Director of Trine Online Graduate Programs*

Instructor  
College of Graduate and Professional Studies  
B.A. (Saginaw Valley State University); M.S.L. (Trine University)

## Trine University

Kandee Heisler (2010)

Lecturer, Department of Humanities & Communication  
Jannen School of Arts & Sciences  
B.A., M.A. (Morehead State University)

Allen Hersel (2003) *Dean*

Professor, McKetta Department of Chemical & Bioprocess Engineering  
Allen School of Engineering and Computing  
B.S. (University of Missouri-Rolla); M.S. (University of Kansas); M.S., Ph.D. (Yale University)

Tricia Hersel (2013)

Lecturer  
Ketner School of Business  
B.B.A. (Hofstra University); M.B.A. (St. Johns University)

Michael Hess (2014)

Assistant Professor, Department of Criminal Justice  
Jannen School of Arts & Sciences  
B.S. (Michigan State University); M.L.E.O.T.C. (Police Officer Certification);  
J.D. (Thomas Cooley Law School)

Gerald Holland (2017)

Lecturer, College of Graduate and Professional Studies  
B.S., M.S., M.B.A. (Michigan State University)

Timothy Hopp (2003)

Professor, Department of Humanities & Communication  
Jannen School of Arts & Sciences  
B.A. (Rocky Mountain College); M.A. (University of Maine);  
Ph.D. (Texas A. & M. University-Commerce)

Jeremy Howard (2015) *Assistant Coordinator of Student Success*

Instructor, Department of Academic Services  
B.S. (Trine University); M.S. (Trine University)

Timothy Jenkins (2012)

Associate Professor, Department of Design Engineering Technology  
Allen School of Engineering and Computing  
B.S., M.S., Ph.D. (Michigan Technological University)

Jian, Lingxiao "Jenson" (2015) *Associate Director*

Global Partnerships  
College of Graduate & Professional Studies  
B.S. (The University of Hong Kong); M.B.A. (Trine University)

## Trine University

Ira Jones (1983)

Professor, Department of Science

Rinker-Ross School of Health Sciences

B.S. (Davidson College); M.S. (New York University); Ph.D. (Auburn University)

Mark Kays (2007) *Director*

Associate Professor, Music Program

Jannen School of Arts & Sciences

B.S. (Ball State University), M.S. (Indiana University)

Haseeb Kazi (2006) *Faculty President; Chair*

Professor, Department of Mathematics & Physics

Jannen School of Arts & Sciences

B.S. (University of Punjab), M.S. (Quaid-I-Azam University),

M.S., Ph.D. (Southern Illinois University)

Chad Keefer (2005)

Assistant Professor, Department of Mathematics & Physics

Jannen School of Arts & Sciences

B.S., M.A., Ed.D. (Ball State University)

Mahesh Khadka (2016)

Assistant Professor, Department of Electrical & Computer Engineering

Allen School of Engineering & Technology

B.S. (Nepal Engineering College); M.S., Ph.D. (Oklahoma State University)

Anthony Kline (2012) *Dean*

Associate Professor, Franks School of Education

B.S., M.A., Ph.D. (Ball State University)

Jon Koch (2014)

Associate Professor, Wade Department of Mechanical & Aerospace Engineering

Allen School of Engineering and Computing

B.S. (Valparaiso University); M.S., Ph.D. (Stanford University)

Marek Kolar (2009)

Associate Professor, Ketner School of Business

B.B.A. (Northwood University); M.A. (Western Michigan University);

Ph.D. (Michigan State University)

Vinnie Lang (2014)

Instructor, Department of Exercise Science

Rinker-Ross School of Health Sciences

B.A., M.S. (Purdue University)

## Trine University

Anthony Layson (2009)

Associate Professor, Department of Science

Rinker-Ross School of Health Sciences

B.Sc. (Indiana-Purdue University); Ph.D. (Iowa State University)

Amanda Malefyt (2012) *Chair*

Associate Professor, McKetta Department of Chemical & Bioprocess Engineering

Allen School of Engineering and Computing

B.S. (Tri-State University); Ph.D. (Michigan State University)

Dan Matthews (1983)

Associate Professor, Department of Computer Science and Information Technology

Allen School of Engineering and Computing

B.S. (Tri-State University); M.S. (Indiana University)

Melissa Mayus (2017)

Assistant Professor, Department of Humanities & Communication

Jannen School of Arts & Sciences

B.A. (University of Notre Dame); M.A. (Saint Louis University); M.A. (University of Iceland); Ph.D. (University of Notre Dame)

Jeffrey McGowan (2016)

Assistant Professor, Ketner School of Business

B.B.A., M.B.A. (University of Notre Dame); C.P.A.

Jennifer Meloche (2017)

Assistant Professor, Department of Exercise Science

Rinker-Ross School of Health Sciences

B.S. (Alma College); Ph.D. (University of Notre Dame)

John Milliken (2004) *Assistant Vice President for Academic Success*

Professor, Department of Criminal Justice

Jannen School of Arts & Sciences

B.A. (The Ohio State University); J.D. (University of Toledo)

Andrea Mitofsky (2008)

Associate Professor, Department of Electrical & Computer Engineering

Allen School of Engineering and Computing

B.S., M.S., Ph.D. (University of Illinois)

Kevin Molyet (2009)

Associate Professor, Wade Department of Mechanical & Aerospace Engineering

Allen School of Engineering and Computing

B.S., M.S., Ph.D. (University of Toledo)

## Trine University

Dawn Moore (2015)

Assistant Professor, Ketner School of Business

B.A. (Indiana University); M.B.A (Indiana Wesleyan University); Ph.D. – DBA (Indiana Tech)

Vicki Moravec (2002) *Chair*

Professor, Department of Science

Rinker-Ross School of Health Sciences

B.S. (Indiana University Purdue University-Fort Wayne);

Ph.D. (University of Illinois-Chicago)

Mary Moretto (2015)

Assistant Professor

Warsaw Educational Center

College of Graduate & Professional Studies

Timothy J. Murphy (2008)

Instructor, Reiners Department of Civil & Environmental Engineering

Allen School of Engineering and Computing

B.S. (Virginia Polytechnic and State University); M.S. (University of Texas)

Starr Newman (2018)

Instructor, Master of Physician Assistant Studies

Rinker-Ross School of Health Sciences

B.S. (Purdue University); B.S.P.A. (University of St. Francis); NCCPA Certification (State of Indiana)

Cindy Neyer (1998)

Associate Professor, Department of Mathematics & Physics

Jannen School of Arts & Sciences

B.S. (University of Kansas); Ph.D. (Iowa State University)

Angelia Niederhelfman (2017)

Assistant Professor, Department of Mathematics and Physics

Jannen School of Arts & Sciences

B.S. M.S. (Indiana – Purdue University, Fort Wayne)

Christine Olding (2018)

Assistant Professor, Department of Humanities and Communication

Jannen School of Arts & Sciences

B.A., M.A. (University of Dayton); Ph.D. (Kent State University)

Francisco Ortiz (2015)

Instructor, Department of Criminal Justice

Jannen School of Arts & Sciences

B.S. (Trine University); M.S. (Indiana Wesleyan University)

## Trine University

Ashley Overton, (2016)

Assistant Professor, Franks School of Education

B.S., M.Ed. (Lincoln Memorial); Ph.D. (Indiana State University)

Ryan Overton (2012) *Chair*

Associate Professor, Reiners Department of Civil & Environmental Engineering

Laurence L. Dresser Chair of Engineering

Allen School of Engineering and Computing

B.S., M.S., Ph.D. (University of Tennessee)

Hong Park (2009)

Associate Professor, Department of Science

Rinker-Ross School of Health Sciences

B.S. (Pukyong National University) M.S., Ph.D. (University of Wisconsin - Milwaukee)

John Patton (2014)

Associate Professor, Department of Biomedical Engineering

Allen School of Engineering and Computing

B.S. (University of Michigan); M.S. (New Mexico State University); Ph.D. (Rice University)

Brandon Podgorski (2017)

Assistant Professor, Ketner School of Business

B.G.S. (Indiana University); M.S. (Ohio State University)

Danny Powell (2014)

Assistant Professor, Ketner School of Business

B.S.B.A. M.B.A., M.A. (Indiana Wesleyan); Ed.D. (Oakland City University)

Jeffrey Raymond (2014)

Instructor, McKetta Department of Chemical & Bioprocess Engineering

Allen School of Engineering and Computing

Jeremy Rentz (2010) *Chair*

Associate Professor, Reiners Department of Civil & Environmental Engineering

Allen School of Engineering and Computing

B.S., Ph.D. (University of Iowa)

Deborah Richard (2019)

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B.A., MBOL, MBA (Defiance College)

Patrick Ridout (2016)

Instructor

Information Services, Academic Success Center

B.A. (Indiana University Southeast); M.L.I.S. (Indiana University)

Mark James Roselli (2016) *Director*

## Trine University

Associate Professor, Global Partnerships & College of Graduate and Professional Studies  
B.A. (Webster University); M.B.A. (Avila University); Ph.D. (University of Missouri)

Jennifer Royston (2018)

Assistant Professor, Department of Humanities & Communication  
Jannen School of Arts & Sciences

B.S. (Eastern Michigan University); M.A. (University College London); Ph.D. (Michigan State University)

Thomas Ruediger (2014) *Director*

Associate Professor, Doctor of Physical Therapy  
Rinker-Ross School of Health Sciences

B.A. (Concordia College); M.P.T. (Baylor University); D.S. (Rocky Mountain University);  
D.P.T. (University of Montana)

John Shannon (2007-2015, 2018) *Vice President of Academic Affairs*

Professor, English

B.A. (State University of New York); M.A. (Southern Illinois University);  
Ph.D. (Ohio State University)

Sameer Sharma (2008)

Associate Professor, Department of Electrical & Computer Engineering  
Allen School of Engineering and Computing

B.S. (Punjab Engineering College, India); M.S. (Brandeis University); M.S.,  
Ph.D. (Oklahoma State University)

Thomas Smead (2017)

Lecturer, College of Graduate & Professional Studies

B.S., M.B.A. (Indiana Institute of Technology)

Vernon Stanger (2015)

Lecturer, Ketner School of Business

C.P.A., M.B.A. (Indiana Purdue Fort Wayne)

Ervin Stanley (2017)

Assistant Professor, Department of Mathematics & Physics  
Jannen School of Arts & Sciences

B.A. (Friends University); M.A. (Ball State University)

Michael Staude (2018)

Assistant Professor, Department of Science  
Rinker-Ross School of Health Sciences

B.S. (University of Northern Iowa); Ph.D. (Notre Dame)

## Trine University

Shane Steele (2015) *Chair*

Associate Professor, Department of Exercise Science,  
Rinker-Ross School of Health Sciences  
B.S. (Boston University); D.P.T. (Rosalind Franklin University of Medicine and Science)

Steven Sullivan (2015)

Assistant Professor, Doctor of Physical Therapy  
Rinker-Ross School of Health Sciences  
M.B.A. (Bethel College); D.P.T. (Creighton University)

Catherine Swick (2010) *Dean Undergraduate Programs*

Associate Professor, Department of Exercise Science  
Rinker-Ross School of Health Sciences  
B.S., M.Ed., Ph.D. (Bowling Green State University)

Thomas Swick (2012) *Chair*

Assistant Professor, Ketner School of Business  
B.S., M.B.A. (Bowling Green State University)

Kendall Teichert (2017)

Assistant Professor, Wade Department of Mechanical & Aerospace Engineering  
Allen School of Engineering and Computing  
B.S., M.S. (Brigham Young University); Ph.D. (University of Michigan)

Joseph Thompson (2010)

Instructor, Wade Department of Mechanical & Aerospace Engineering  
Allen School of Engineering and Computing  
B.S. (Trine University)

Alison Todd (2016)

Assistant Professor, Franks School of Education  
B.A. (Union College); M.Ed. (Lesley University); M.A. (Castleton State College)

Kelly Trusty (2015)

Associate Professor, Ketner School of Business  
B.A. (Purdue University); M.A. (Ball State University);  
Ph.D. (Western Michigan University)

R. Thomas Trusty (2007) *Associate Dean, Engineering Technology; Chair, Department of Design Engineering*

Associate Professor, Department of Design Engineering Technology  
Allen School of Engineering and Computing  
B.S. (Purdue University); M.A. (Ball State University); M.S. (Trine University)



## Trine University

Timothy Tyler (1993 -1998, 1999)

Professor, Reiners Department of Civil & Environmental Engineering  
Allen School of Engineering and Computing  
B.S., M.S. (West Virginia University); Ph.D. (Virginia Polytechnic);  
P.E. Virginia and Indiana

Emilio Vazquez (2014) *Medical Director*

Associate Professor, Physician Assistant Studies  
Rinker-Ross School of Health Sciences  
B.S. (George Washington University); M.D. (University of Maryland School of Medicine)

John Wagner (1994)

Professor, McKetta Department of Chemical & Bioprocess Engineering  
Allen School of Engineering and Computing  
B.S. (University of Colorado); Ph.D. (Rice University); P.E. Ohio

Emily Watkins (2019)

Assistant Professor, Department of Exercise Science  
Rinker-Ross School of Health Sciences  
B.S. (Purdue University); D.P.T. (Trine University)

Melanie Watson (2015)

Associate Professor, Department of Biomedical Engineering  
Allen School of Engineering and Computing  
B.S., M.S.E., Ph.D. (Louisiana Tech)

Darryl Webber (2006) *Chair*

Professor, Wade Department of Mechanical & Aerospace Engineering  
Allen School of Engineering and Computing  
B.S. (Montana College of Mineral Science and Technology);  
M.S. (Montana Tech of the University of Montana);  
Ph.D., (Missouri University of Science & Technology)

Tricia Widenhoefer (2016)

Assistant Professor, Doctor of Physical Therapy  
Rinker-Ross School of Health Sciences  
B.A., M.S. (University of Indianapolis); D.P.T. (University of Montana)

Brittany Winn (2017)

Instructor, Department of Science  
Rinker-Ross School of Health Sciences  
B.S. (Trine University); M.A. (Ball State University)

Kevin Woolverton (2015)

Associate Professor, Department of Electrical & Computer Engineering  
Allen School of Engineering and Computing  
B.S. (Kansas State University); M.S. (Oklahoma State University); Ph.D. (Texas Tech University)

## Trine University

Kimberly Wright (2014)

Assistant Professor, Department of Psychology & Social Sciences  
Jannen School of Arts & Sciences

B.A. (Miami University); M.A. (Bowling Green State University)

Donna Wyse (2016)

Instructor, Department of Psychology & Social Sciences  
Jannen School of Arts & Sciences

B.S. (Defiance College); M.S. (Capella University)

Godfred Yamoah (2016)

Assistant Professor, Department of Mathematics & Physics  
Jannen School of Arts & Sciences

B.S., M.S. (University of Lagos); Ph.D. (Clarkson University)

Sarah Zimmer (2016)

Lecturer, Department of Humanities & Communication  
Jannen School of Arts & Sciences

B.A., (Columbia College); M.F.A. (Cranbrook Academy of Art)

Christina Zumbrun (2006)

Associate Professor, Department of Mathematics & Informatics  
Jannen School of Arts & Sciences

B.B.S. (Hardin-Simmons University); M.S. (Purdue University);  
Ph.D. (Western Michigan University)

## FACULTY & ADMINISTRATION EMERITI

Jerry Beehler (1969) Professor Emeritus, 2005; Mathematics  
Ann Benson (1985) Professor Emeritus, 2018; Science  
John Berger (1983) Professor Emeritus, 1994; Business Administration  
Jean Deller (1989) Professor Emeritus 2018; Education  
Arthur E. Eberhardt (1952) Professor Emeritus, 1990; Electrical Engineering  
Carl H. Elliot (1974) President Emeritus, 1983  
Satish Goyal (1979) Professor Emeritus, 1987; Civil Engineering  
Albert Guilford (1957-59, 1961-62, 1963, 1967) Professor Emeritus, 2005; Civil & Envir. Engineering  
Karen Hamilton (2007) Professor Emeritus, 2016; Education  
Roger Hawks (1977) Professor Emeritus, 2009; Mechanical & Aerospace Engineering  
William W. Hill (1961) Professor Emeritus, 1993; Mechanical & Aerospace Engineering  
Peter Hippensteel (1964) Professor Emeritus, 2005; Biology  
Joan Karbach (1994) Professor Emeritus, 2006; English  
Leo F. Kuhn (1961) Professor Emeritus, 1992; Engineering Graphics  
Sushil Kumar (1981) Professor Emeritus, 2005; Civil & Environmental Engineering  
Richard Kruger (1965) Associate Professor Emeritus, 2006; Mathematics  
Donald Jones (1996) Professor Emeritus, 2019; Communication  
Michael J. Lesiak (1967) Associate Professor Emeritus, 2004; Accounting  
William Maddock (1998) Professor Emeritus, 2019; Sport Management  
Kenneth Meeks (1997-2008) Professor Emeritus, 2008; Civil Engineering  
William Meyers (1964-66, 1972-76, 1983) Professor Emeritus, 2005; Aero. & Mechanical Engineering  
Derald Moore (1968) Professor Emeritus, 1998; Social Sciences  
John E. Morin (1966) Professor Emeritus, 2004; Social Sciences  
Edward Nagle (1967) Professor Emeritus 2008; Department of Technology  
Aldo R. Neyman (1986) Professor Emeritus, 1999; Business Administration  
Dennis Petrie (1975) Professor Emeritus, 2010; Language & Humanities  
Chester A. Pinkham (1967) Professor Emeritus, 2002; Chemistry  
R. John Reynolds (1993) President Emeritus, 2000  
Richard A. Ruselink (1966) Associate Professor Emeritus, 2004; Mathematics  
Majid Salim (1984) Professor Emeritus, 2019; Chemical Engineering  
Jeanine Samuelson (1986) Professor Emeritus, 2016; English  
Lawrence Samuelson (1983) Professor Emeritus, 2010; Electrical & Computer Engineering  
William R. San Giacomo (1965) Professor Emeritus, 2012; Golf Management  
VK Sharma (2008) Professor Emeritus, 2015; Engineering  
Leonard E. Sheffield (1966) Professor Emeritus, 1998; Business Administration  
Sally Simpson (1995) Professor Emeritus, 2014; Education  
Alan R. Stoudinger (1962) Professor Emeritus, 2003; Electrical & Computer Engineering  
Frank Swenson (1982) Professor Emeritus, 1998; Mechanical Engineering  
David Syler (1968) Professor Emeritus, 2009; Mathematics  
Dolores Tichenor (1967) Professor Emeritus, 2010; Mathematics  
Thomas Tierney (1974) Professor Emeritus, 2013; Language & Humanities  
Debra VanRie (1991) Professor Emeritus, 2019; Mathematics  
Suzanne Van Wagner (1983) Professor Emeritus, 2012; Education  
William J. Walter (1972) Professor Emeritus, 1993; Business Administration  
Kathie Wentworth (1993) Professor Emeritus, 2018; Academic Support Services  
Robert Whelchel (1969-72, 1974) Professor Emeritus, 2008; Electrical & Computer Engineering  
James Zimmerman (1973) Professor Emeritus, 2005; Arts & Sciences

