2020-2021

Oregon TECH

GENERAL CATALOG

Oregon Institute of Technology
University Catalog
© 2020-2021

www.oit.edu
(541) 885-1000
3201 Campus Drive, Klamath Falls, OR 97601-8801

Hands-on education for real-world achievement.

Welcome to Oregon Tech

General Information

Welcome new and returning students to Oregon Institute of Technology, or Oregon Tech! Below is information that will help you on your educational journey at our university. We're here to help, so please contact us with any questions you may have so we can make your time at Oregon Tech successful and enjoyable.

Admissions Office

The Oregon Tech Admissions Office is located on the first floor of the College Union on the Klamath Falls campus; and in the Student Services area at the Portland-Metro campus on the first floor. It is open weekdays from 8am to 5pm (9am to 5pm at Portland-Metro) to serve prospective students, applicants and their families, as well as high school guidance counselors, college-transfer advisors and teachers.

If you are interested in seeing the Klamath Falls campus, the Admissions Office's visit coordinator can arrange for you to meet with a faculty member and an admissions counselor, tour the residence halls and the rest of the campus, sit in on a class and/ or talk with one of our coaches. To set up a campus visit, call (800) 422-2017 or (541) 885-1150. Hearing-impaired persons may call the TTY number: (541) 885-1072. You also can request a campus visit at www.oit.edu or by emailing oit@oit.edu. If you wish to visit one of Oregon Tech's other campuses such as Portland-Metro, the Admissions Office can provide you with a contact person who can make arrangements for you.

Non-Discrimination Policy

Oregon Tech does not discriminate on the basis of race, color, ethnicity, national origin, gender, disability, age, religion, marital status, sexual orientation or gender identity in its programs and activities. The following individuals are designated to handle inquiries and complaints regarding this non-discrimination policy: Civil Rights Officer, Title IX Coordinator (sex-based and gender-based discrimination) (541) 885-1108; email: oithr@oit.edu

Students with Disabilities

Oregon Tech is committed to accommodating the academic and programmatic needs of qualified students with disabilities. Students with disabilities who anticipate needing accommodations should contact Disability Services, LRC 229C, as soon as possible in advance of enrollment, to ensure timely provision of services. Questions may be directed to: Disability Services, Oregon Tech, 3201 Campus Dr., Klamath Falls, OR 97601-8801. (541) 851-5227.

Alternate Format

This publication is available in an alternate format for persons with disabilities. Please contact Disability Services at (541) 851-5227.

Accreditation

Oregon Tech is accredited by the Northwest Commission on Colleges and Universities (NWCCU), 8060 165th Avenue, N.E., Suite 100, Redmond, WA 98052-3981. NWCCU is an institutional accrediting body recognized by the Council for Higher Education and/or the Secretary of the U.S. Department of Education. Accreditation, licensure or approval of individual programs are listed in departmental sections. Copies of accreditation documents are available in the Office of the Vice President for Academic Affairs/Provost, Oregon Tech, 3201 Campus Dr., Klamath Falls, OR 97601-8801.

General Catalog Production

The 2020-21 General Catalog was produced by the Registrar's Office: Wendy Ivie, University Registrar, and Allison Baker, Administrative Program Specialist. Information in this catalog was accurate at the time of publication, but is subject to change without notice and does not constitute a contract between Oregon Tech and the student or applicant. The general catalog is published annually and available on the web at www.oit.edu.

History at a Glance

1947 – July 14, under the direction of first president, Winston Purvine, the first classes at Oregon Vocational School were held in a deactivated World War II Marine Corps hospital three miles northeast of Klamath Falls.

1948 – In a vote by the State Board of Education, the University's name was changed to Oregon Technical Institute – also known as OTI or Oregon Tech.

1950 – KTEC radio went on the air broadcasting from Oregon Tech’s campus.

1953 – Associate degree programs in the Surveying and Structural Engineering Technologies were first accredited by the Engineers' Council for Professional Development.

1956 – KOTI television opened and went operational on campus.

1957 – Oregon Tech was made a separate division of the State Board of Education and an engineering study was begun to determine whether to repair or rebuild the facilities.

1960 – Oregon Tech was transferred to the jurisdiction of the State Board of Higher Education.

1962 – Oregon Tech was accredited by the Northwest Association of Secondary and Higher Schools.

1964 – Oregon Tech moved to its newly constructed campus on a geothermal site overlooking Upper Klamath Lake.

1966 – Oregon Tech received authorization to grant bachelor's degrees.

1970 – Bachelor's degree programs first accredited by ABET.

1973 – OTI name changed to Oregon Institute of Technology or OIT; Oregon Tech continues in use as well.

1975 – Geo-Heat Center established.

1976 – Kenneth Light appointed 2nd President of Oregon Tech upon Purvine's retirement.

1983 – Larry Blake appointed 3rd President of Oregon Tech. Metro Center established in Portland to offer in-demand degrees.

1984 – Small Business Development Center established.

1988 – Portland Metro Center moved to its first permanent facilities on Southeast Harmony Road in Clackamas.

1989 – State Board of Higher Education authorized Oregon Tech to grant master's degrees.

1991 – Lawrence J. Wolf appointed 4th President of Oregon Tech.

1995 – First Master's degree offered.

1997 – First online degrees offered.

1998 – Martha Anne Dow appointed 5th President of Oregon Tech.

2001 – Oregon Renewable Energy Center (OREC) established in law by the Oregon legislature.

2005 – Oregon Center for Health Professions established.

2008 – Christopher G. Maples appointed 6th President of Oregon Tech. Martha Anne Dow Center for Health Professions opens.

2012 – Oregon Tech's Portland-Metro presence expands with the opening of the Portland-Metro campus in Wilsonville and broadens degree options.

2015 – Oregon Institute of Technology became an independent public body governed by its own Board of Trustees.

2017 – Nagi G. Naganathan appointed 7th President of Oregon Tech.

2018 – Oregon Tech becomes the landlord and operations host of the Oregon Manufacturing Innovation Center Research and Development (OMIC R&D) in Scappoose, Oregon, and becomes a member of the industry/higher education advanced manufacturing R&D partnership organization.

Welcome

Welcome to Oregon Tech! You have chosen a university that will challenge you, excite you, and provide many opportunities for you to learn, innovate and grow in a unique polytechnic university environment. Oregon Tech graduates are known for their ability to excel immediately in their careers as well as in graduate and professional schools. This means that, on average, Oregon Tech graduates earn some of the highest starting salaries in the nation – an average of $60,000.

The small class size and hands-on, applied approach to education at Oregon Tech is perfectly tailored to an experiential learning environment that encourages communication, collaboration, and engaging in professional practice. Oregon Tech is focused on providing high value to students, and a high return on investment to our graduates who excel across many industries and in-demand fields. Our tag line, "Hands-on education for real-world achievement," is more than a slogan – it truly is the way we do business. Faculty members bring their real-world problem-solving experiences into the classroom, and Oregon Tech students have myriad opportunities to gain professional experience outside the classroom through externships, internships, field work, cooperative programs, and capstone projects.

By attending Oregon Tech, you have chosen rigor, quality, and relevance. You are now part of our focus on excellence, innovation, and professional preparation that have served Oregon Tech's graduates well and have continuously increased our reputation and rankings in Oregon, the Pacific Northwest, and nationally. Welcome to the Oregon Tech Family – we're glad you're here and we very much look forward to helping you achieve your own personal and professional success while you are here as students and after you graduate as alumni!

Mission Statement and Core Themes

Mission Statement

Oregon Institute of Technology (“Oregon Tech”), Oregon’s public polytechnic university, offers innovative, professionally-focused undergraduate and graduate degree programs in the areas of engineering, health, business, technology, and applied arts and sciences. To foster student and graduate success, the university provides a hands-on, project-based learning environment and emphasizes innovation, scholarship, and applied research. With a commitment to diversity and leadership development, Oregon Tech offers statewide educational opportunities and technical expertise to meet current and emerging needs of Oregonians as well as other national and international constituents.

Core Themes

Oregon Institute of Technology:

- Applied Degree Programs
- Student and Graduate Success
- Statewide Educational Opportunities
- Public Service

Essential Learning Outcomes for Students

Oregon Tech's Essential Student Learning Outcomes (ESLOs) support Oregon Tech's institutional mission and core themes. The outcomes and associated criteria reflect the rigorous applied nature of Oregon Tech's degree programs.

The ESLOs reflect the common expectations about the knowledge, skills, and abilities that Oregon Tech students will acquire and are reflected in the General Education requirements that lay the foundation upon which the major curricula build. Engaging in these ESLOs will support Oregon Tech graduates in developing the habits of mind and behaviors of professionals and lifelong learners.
Oregon Tech students will:

- *communicate* effectively orally and in writing;
- engage in a process of *inquiry and analysis*;
- make and defend reasonable *ethical* judgments;
- collaborate effectively in *teams* or groups;
- demonstrate *quantitative literacy*;
- explore *diverse perspectives*.

About Oregon Tech

For more than 70 years, Oregon Institute of Technology (Oregon Tech) has focused on changing the lives of Oregonians by preparing them to meet the technology, innovation and management needs of business, industry and health care. Oregon Tech is accredited by the Northwest Commission on Colleges and Universities, and individual programs are also accredited by the appropriate professional organizations. Today, Oregon Tech offers more than 45 Bachelor of Science and Master's degree programs in engineering, technology, health technologies, management, communication and the applied sciences. These include a growing number of bachelor degrees and degree-completion programs offered online, and bachelor's and master's degree programs that can be entirely completed at Oregon Tech's Portland-Metro campus in Wilsonville.

With a mission to deliver technology education throughout the Pacific Northwest and to students from other part of the country and world, we partner with business and industry leaders to ensure our programs adapt to new technologies and workforce demands. Oregon Tech's focus on professional practice gives our students a competitive edge: nearly 97 percent are employed or in graduate school within six months of graduation. Year after year, our graduates garner the highest starting salaries in Oregon and among the highest in the nation.

Our applied approach to teaching, which blends theory and practice, is the main reason our graduates and alumni are so avidly recruited. Oregon Tech students have amazing opportunities to apply what they learn in lab-based classes, clinics, externships and workplaces; and in clubs and special activities like Catalyze Klamath Falls invention initiative. Oregon Tech's faculty and staff, who come to Oregon Tech with relevant business, industrial, or clinical experience, reinforce this practical focus in the classroom. And in every program, a relevant interdisciplinary core underscores major studies, broadening students' understanding of the world and teaching them to communicate effectively, solve problems, and think for themselves. This student-focused approach to teaching and learning engages students in professional practice throughout their time at Oregon Tech.

One Oregon Tech, Three Primary Campuses, and Program-Specific Sites

Oregon Tech is one institution with multiple locations. Established in 1947, Oregon Tech offers bachelor's and master's degree programs at locations throughout Oregon and beyond to meet the needs of students seeking a top quality, professionally focused education.

Oregon Tech's main residential campus is located in **Klamath Falls** in beautiful Southern Oregon, and is nestled on the eastern slope of the Cascade Mountains. The 190-acre campus offers spectacular views of Upper Klamath Lake, pine-studded knolls and snow-capped peaks from nearly every building. Klamath Falls, a city of about 21,000 residents (67,000 in the urban growth area), is located in Klamath County in south-central Oregon, about 20 miles from the California border and in the same county that boasts Crater Lake National Park. Known as Oregon's "City of Sunshine," Klamath Falls enjoys about 300 days of blue skies each year.

Oregon Tech's **Portland-Metro** campus in Wilsonville, located just south of Portland, offers bachelor's and master's degree programs in a state-of-the-art facility designed to provide an industry-focused, urban university experience in the heart of Oregon's "Silicon Forest". The campus offers high-demand degree programs, and is easily accessible to students of all ages and backgrounds, including business professionals, transfer students and new freshman just out of high school. Oregon Tech provides excellent opportunities for students seeking internships and employment while completing their degrees. Oregon Tech also offers a growing number of **Online** programs for working professionals or returning students who are busy and ready to advance their education as quickly and conveniently as possible. Oregon Tech Online lets students finish certificate, associate's, or bachelor's degrees without leaving home or the office, and without the hassles of travel, childcare or giving up your current job. The primary mission of Oregon Tech Online is to offer convenient programs and courses to both students seeking a degree, and those wishing to skill-up by taking just a course or two.

Oregon Tech also offers a bachelor's program in dental hygiene in **Salem** through a partnership with Chemeketa Community College. The classrooms and dental hygiene clinic are located in Chemeketa's new, state-of-the-art Health & Sciences Building. The program requires one year of prerequisite (pre-dental hygiene) coursework prior to acceptance.

Oregon Tech **Seattle at Boeing** offers bachelor's and master's degrees in Manufacturing Engineering Technology, as well as a Bachelor of Science Degree in both Mechanical Engineering and Mechanical Engineering Technology to employees of Boeing at sites in the Puget Sound area. Also offered are review classes for the Society of Manufacturing Engineers' CMfgT and CMfgE exams and three Certificates of Completion in Composites.

Oregon Tech is accredited by the Northwest Commission on Colleges and Universities. Additional accreditations, licensure and approvals of individual programs are listed in the appropriate program sections of this catalog. Copies of accreditation documents are available in the Office of the Vice President for Academic Affairs/Provost, Oregon Institute of Technology, 3201 Campus Dr., Klamath Falls, OR 97601-8801.

As of January 2015, Oregon Tech Online is an approved institutional participant in the National Council for State Authorization Reciprocity Agreements (NC-SARA) initiative, which allows for increased access to online courses for many out of state students. Oregon Tech Online is authorized by the Washington Student Achievement Council and meets the requirements and minimum educational standards established for degree-granting institutions under the Degree-Granting Institutions Act. This authorization is subject to periodic review and authorizes Oregon Institute of Technology to offer field placement components for specific degree programs. The Council may be contacted for a list of currently authorized programs. Authorization by the Council does not carry with it an endorsement by the Council of the institution or its programs. Any person desiring information about the requirements of the act or the applicability of those requirements to the institution may contact the Council at P.O. Box 43430, Olympia, WA 98504-3430.

Programs by Campus

Klamath Falls

Master of Science

- Applied Behavior Analysis
- Civil Engineering
- Marriage and Family Therapy
- Renewable Energy Engineering

Master of Science/Bachelor of Science

- Electrical Engineering, BS/Renewable Energy Engineering, MS
- Electrical Engineering, BS/MSE
- Renewable Energy Engineering, BS/MS
- Renewable Energy Engineering, BS/MSE

Bachelor of Applied Science

- Technology and Management

Bachelor of Science

- Accounting
- Applied Mathematics
- Applied Psychology
- Biology-Health Sciences
- Business, with options in:
  - Management
  - Marketing
- Civil Engineering
- Communication Studies
- Computer Engineering Technology
- Cybersecurity
- Data Science
- Dental Hygiene
- Diagnostic Medical Sonography
- Echocardiography
- Electrical Engineering, with emphasis in:
  - Electrical Power
  - Microelectronics
  - Renewable Energy
  - Robotics, Autonomous Systems, and Control Engineering
- Embedded Systems Engineering Technology
- Environmental Sciences
- Geomatics, with options in:
  - Geographic Information Systems
  - Surveying
- Health Care Management, with options in:
  - Administration
  - Clinical
- Health Informatics
- Information Technology
- Manufacturing Engineering Technology
- Mechanical Engineering
- Mechanical Engineering Technology
- Nuclear Medicine and Molecular Imaging Technology
- Nursing (through OHSU School of Nursing)
- Operations Management
- Population Health Management
- Professional Writing
- Radiologic Science
- Renewable Energy Engineering
- Respiratory Care
- Software Engineering Technology
- Vascular Technology

Associate of Engineering

- Computer Engineering Technology
- Software Engineering Technology

Minors

- Arts, Literature, and Philosophy (ALPs)
- Applied Mathematics
- Applied Physics
- Applied Statistics
- Biology
- Business
- Chemistry
- Coaching
- Geographic Information Systems
- Health Informatics
- Human Interaction
- Information Technology
- Innovation & Entrepreneurship
- International Business
- Medical Sociology
- Professional Writing and Technical Communication
- Psychology
- Surveying
- Sustainability

Specializations

- Accounting
- Entrepreneur/Small Business
- Management
- Marketing
- Travel and Tourism

Certificates

- Accounting (Post Baccalaureate)
- Applied Behavior Analysis (Graduate)
- Dispute Resolution
- Magnetic Resonance Imaging (MRI)
- Picture Archiving and Communication Systems (PACS)

Portland-Metro

Master of Science

- Applied Behavior Analysis
- Engineering - Specialties
  - Electrical Engineering
  - Embedded Engineering
  - Optical Engineering
  - Power Engineering
  - Robotics, Autonomous Systems and Control Engineering
  - Systems Engineering
- Renewable Energy Engineering

Master of Science/Bachelor of Science

- Electrical Engineering, BS/Renewable Energy Engineering, MS
- Renewable Energy Engineering

Bachelor of Applied Science

- Technology and Management

Bachelor of Science

- Applied Psychology
- Cybersecurity
- Electrical Engineering, with emphasis in:
  - Electrical Power
  - Microelectronics
  - Optical Engineering
  - Renewable Energy
  - Robotics, Autonomous Systems, and Control Engineering
- Electronics Engineering Technology
- Embedded Systems Engineering Technology
- Emergency Medical Services Management (joint degree with OHSU)
- Health Informatics
- Information Technology
- Manufacturing Engineering Technology
- Mechanical Engineering
- Mechanical Engineering Technology
- Medical Laboratory Science (joint degree with OHSU)
- Operations Management
- Renewable Energy Engineering
- Software Engineering Technology

Associate of Applied Science

- Emergency Medical Technology Paramedic

Minors

- Applied Mathematics
- Business
- Health Informatics
- Information Technology
- Psychology
- Surveying

Certificates

- Applied Behavior Analysis (Graduate)

Online

Master of Science

- Allied Health
- Applied Behavior Analysis
- Engineering - Specialties
  - Electrical Engineering
  - Embedded Engineering
  - Optical Engineering
  - Power Engineering
  - Robotics, Autonomous Systems and Control Engineering
  - Systems Engineering

Bachelor of Applied Science

- Technology and Management

Bachelor of Science

- Applied Psychology
- Business, with option in Management
- Dental Hygiene (degree completion)
- Diagnostic Medical Sonography (degree completion)
- Echocardiography (degree completion)
- Health Care Management (degree completion), with options in:
  - Administration
  - Clinical
  - Radiologic Science
- Health Informatics
- Information Technology
- Operations Management
- Radiologic Science (degree completion)
- Respiratory Care (degree completion)
- Vascular Technology (degree completion)

Associate of Applied Science

- Sleep Health, with options in:
  - Clinical Sleep Health
  - Polysomnographic Technology

Minors

- Business
- Health Informatics
- Information Technology
- Psychology

Certificates

- Applied Behavior Analysis (Graduate)
- Clinical Sleep Health
- Magnetic Resonance Imaging (MRI)
- Picture Archiving and Communication Systems (PACS)
- Polysomnographic Technology

Seattle at Boeing

Master of Science

- Manufacturing Engineering Technology

Bachelor of Science

- Manufacturing Engineering Technology
- Mechanical Engineering
- Mechanical Engineering Technology

Chemeketa Community College

Bachelor of Science

- Dental Hygiene

Admissions and Financial Aid

Office of Admissions

College Union, 1st Floor
800-422-2017 (toll free)
(541) 885-1150
(541) 885-1024 (fax)
oit@oit.edu
www.oit.edu/admissions

The Oregon Tech Admissions Office is located on the first floor of the College Union on the Klamath Falls campus. Open weekdays from 8 a.m. to 5 p.m., its primary functions are to help prospective students investigate and evaluate Oregon Tech, to manage applications for admission and to assist applicants with the enrollment process. The Admissions Office operates with the cooperation and support of the entire campus community. Admissions welcomes visiting students and their families to daily tours, and sessions with admissions counselors, coaches, and other staff. Oregon Tech also hosts several Campus Preview events annually. For Campus Preview dates or to register online for a visit or Campus Preview, go to www.oit.edu/visit or call (541) 885-1150 or (800) 422-2017. To visit Oregon Tech Portland-Metro, call (503) 821-1250. Hearing impaired persons may call the TTY number at (541) 885-1072.

Admission requirements apply to all applicants of Oregon Tech. All students who wish to enroll in more than eight credits in a term, receive financial aid and/or graduate from Oregon Tech must apply and be accepted for admission. Applications for general admission (excluding programs requiring specialized admission) are processed on the campus in Klamath Falls regardless of the campus location for the student.

Application Deadlines

The priority application deadline for maximum scholarship and financial aid consideration each fall term is March 1. Oregon Tech accepts applications on a rolling basis, but students must have a complete application on file in Admissions three weeks prior to the first day of classes as follows:

2020-2021	**Application Deadlines**
Fall Term	September 14, 2020
Winter Term	December 14, 2020
Spring Term	March 8, 2021
Summer Term	May 31, 2021

Applications

Applications for admission are available online at www.oit.edu/apply. A complete application consists of an application for admission, application fee, official transcripts, test scores, and other required documentation depending on the type of applicant (see Admission Eligibility Requirements).

Students who were previously admitted, but never enrolled, and students who want to re-enroll after skipping four or more terms must log back into the online application and click the link entitled "new" which is located under the "Admission Term" heading, then select the appropriate application to update their information. Students who have not yet registered for classes may change their entry term by logging back into the online application and click on the link entitled "new" which is located under the "Admission Term" heading, then select the appropriate application to update their term. Students who want to only update their choice of major or choice of campus must use the Application Change Form located online at www.oit.edu/applications under "Additional Resources."

Students who wish to enroll as non-degree seeking students in no more than eight credits per term may submit a Non-Admit Application form; however students must be fully admitted to qualify for financial aid. These forms are available online at www.oit.edu/applications.

International students must complete the International Student Application. Students seeking enrollment through an approved exchange program must complete the International Exchange Application. Both are available online at www.oit.edu/international.

The following majors require a secondary application process after students are granted general admission and after students meet the eligibility requirements of the program. Each program has its own deadlines, admission requirements and processes which are outlined in the departmental pages of this catalog.

- Medical Laboratory Science (OHSU/Portland-Metro)
- Diagnostic Medical Sonography
- Dental Hygiene (Klamath Falls, Salem)
- Echocardiography
- Nuclear Medicine and Molecular Imaging Technology
- Nursing (with OHSU/Klamath Falls)
- Paramedic/EMT (OHSU/Portland-Metro)
- Radiologic Science
- Respiratory Care
- Vascular Technology

Application Procedures

Every applicant must complete the following steps:

1. Complete the appropriate *Application for Admission* (www.oit.edu/applications).
2. Submit the $50 non-refundable application fee. Students who qualify may opt to defer the application fee until enrollment in classes.

3. Applicants who have earned fewer than 36 college credits must have official SAT I or ACT scores sent to Oregon Tech. Some applicants who graduated from high school three or more years ago may be exempted from this requirement by permission of the Admissions Director.
4. Have official transcripts from all post-secondary institutions that you attended, or received credit from, sent directly to the Oregon Tech Admissions Office. Any offer of admission is contingent upon the submission of satisfactory final transcripts prior to enrollment at Oregon Tech.
5. Have final official high school transcripts or GED test results sent directly to the Oregon Tech Admissions Office. High School records are not required from applicants who graduated prior to 1997 and who have earned at least 36 transferable quarter college credits or 24 transferable college semester credits. Applicants who are currently enrolled in high school may be admitted on the basis of six or more semesters of high school work provided that they will have met the 13 subject requirements at the time of high school graduation. In any case, each student's final official high school transcript must be provided upon graduation to complete the admission process.
6. Have official Advanced Placement (AP) or International Baccalaureate (IB) score reports sent to the Oregon Tech Admissions Office, if applicable.

Some online programs have additional eligibility requirements. To determine your eligibility for a specific program, please visit www.oit.edu/online/evf. Some programs at Oregon Tech do not have sufficient space to enroll all qualified applicants who seek admission. In these cases, Oregon Tech reserves the right to offer admission to the most qualified applicants, on a first-come, first-served basis or through a combination of the two strategies.

Upon admission and prior to registration, a completed health form showing evidence of adequate immunizations must be on file with Oregon Tech's Student Health Center. For further information, see the Student Health Center section of this catalog. Students are not required to submit these forms if taking fewer than six credits per term.

If a student fails to submit the required documents in complete and satisfactory order, admission and registration may be cancelled. All records become the property of Oregon Tech.

Social Security Number Disclosure and Consent Statement

Students are requested to provide, **voluntarily**, a Social Security Number (SSN) to assist Oregon Tech in developing, validating or administering predictive tests and assessments; administering student aid programs; improving instruction; internal identification of students; student parking; collection of student debts; or comparing student educational experiences with subsequent workforce experiences. By providing your Social Security Number, students consent to the uses identified above. This request is made pursuant to ORS 351.070 and 351.085. Provision of a Social Security Number and consent to its use is not required and, if a student chooses so, will not be denied any right, benefit or privilege provided by Applicants may enter a series of zeros (000-00-0000) on their admission application in place of their actual SSN, but should be aware that by not providing their SSN they will not be eligible to receive federal student aid or some university scholarships.

Additionally, applicants should be aware that Oregon Tech is required to obtain a Social Security Number in order to file certain returns with the Internal Revenue Service (IRS) for the applicant to receive a 1098T and to furnish a statement to you. The returns that Oregon Tech must file contain information about qualified tuition and related expenses. Privacy Act Notice: Section 6109 of the Internal Revenue Code requires students to give a correct SSN to persons who must file information returns with the IRS to report certain information. The IRS uses the SSN for identification purposes and to help verify the accuracy of tax returns. For more information, refer to IRS code 6050S.

Admission Requirements

First-Year Admission

Effective 2021-2022, Oregon tech will admit first year applicants based up an unweighted college-preparatory GPA with no requirement to submit standardized test scores such as the ACT, SAT, SATII, AP, or IB. The college-prep GPA will be recalculated based upon 15 courses, including a required fourth year of math that uses Algebra II as a prerequisite. Students may be deficient in no more than two courses, unless the two courses are combined in Math and Lab Science. While there is no minimum ACT or SAT score, nor are score submissions required for admission review, scores may be used to meet course deficiencies and for placement purposes at the time of enrollment. Deficiencies are courses not taken or courses in which a grade of D or F was earned. Repeat courses may be used to replace grades. Applicants older than 22 are exempt from the college-prep course requirements as well as students who took the GED. Merit-based scholarships awarded at the time of admission will use cumulative high school GPA.
For first-year admission, students must meet entrance requirements adopted by the State Board of Higher Education in Oregon. Applicants who are enrolled in or who have graduated from regionally accredited high schools must:

1. All first-year applicants must report subjects and grades on the application. Unless requested to do so by the Admissions Office, please to not submit transcripts. A final high school transcript, with graduation date will be required before registering for classes. An unweighted cumulative high school grade point average of 3.00 is required for admission. Applicants with a GPA between 2.50 and 2.99 may qualify for admission provided they submit adequate SAT Reasoning Exam scores or ACT scores.
2. Applicants may report test scores on the application if SAT Reasoning Exam, SAT I or ACT test have been completed by the applicant.
    a) Applicants with an unweighted cumulative high school grade point average of 3.00 or better must take the SAT or ACT and have official scores submitted to Oregon Tech for course placement, but there is no minimum SAT or ACT score.
    b) Applicants with an unweighted GPA of 2.75 to 2.99 must submit a total SAT score of 880 with a score of at least 440 on the Math portion of the SAT. Those submitting ACT results must have an ACT Math score of at least 17 and a Composite score of at least 17.
    c) Applicants with an unweighted GPA of 2.50 to 2.74 must submit a total SAT score of 1080 with a score of at least 530 on the Math portion of the SAT. Those submitting ACT results must have an ACT Math score of at least 21 and a Composite score of at least 21.
    d) Applicants who have graduated from a standard high school three or more years prior to the term they wish to be admitted and enter the university are not required to submit SAT or ACT aptitude test scores. However, if an applicant wishes to be considered for university scholarships, they must submit aptitude test scores.
3. Applicants must satisfactorily (grade of C- or above) complete at least 15 units (one year is equal to one unit) of college preparatory work in the following areas, unless they graduated from high school prior to spring 1985.
    a) English (4 units). Shall meet one of the following: four years of high school English (composition/literacy-based); ACT English score of 21+; SAT Critical Reading score of 580+; or one transferable three-credit college English Composition course.
    b) Mathematics (4 units). Shall meet one of the following: four years of high school math courses, including one year each of Algebra I, geometry, Algebra II, and an advanced class for which Algebra II is a prerequisite; ACT Math score of 24+; SAT Math score of 570+; or one transferable three-credit college math course for which at least intermediate algebra is a prerequisite.

c) Social Science (2 units). Shall meet two of the following from: History/Social Studies (one year high school American History; SAT II American History/Social Studies core of 560+; or one transferable three-credit college American History course); One year high school social science (such as European history, world history, economics, sociology, geography, government, psychology, or anthropology); SAT II World History score of 580+; or one transferable three-credit college social science course.

d) Laboratory Science (3 units). Shall meet one of the following: three years of high school laboratory science (one year each of biology, chemistry, earth science, or physics. An integrated science class may be substituted for one required course); two year high school laboratory science (biology, chemistry, earth science or physics) plus one of the following test scores (ACT Science score of 20+; SAT Chemistry score of 600+, Biology score of 590+, or Physics score of 620+); three transferable four-credit college lab sciences courses (one semester each of biology, chemistry, earth science, and physics). An integrated science or advanced level science class may be substituted for one required course.

e) Career and Technical Education or Fine Art (1 unit). Shall meet one of the following: one year or a two-semester combination of high school Fine Arts or Career and Technical Education (CTE); one transferable three-credit college Fine Arts or CTE course; semesters of fine art and career and technical education cannot be combined.

f) Academic Elective (1 unit). Shall meet one of the following: courses such as computer science, STEM, engineering, or other college prep-course that may fall within any of the above subjects.

4. Applicants who are unable to meet the 15 subject requirements may be eligible for admission by earning a minimum score of 470 or above (940 total) on each of two College Board SAT Subject Tests (in Math level I or IIC and another test of the student's choice).
5. Applicants who have not graduated from high school and who are applying on the basis of GED scores must submit test results showing a minimum of 170 on each subject area and 680+ overall. A special admission option will be offered to test takers who scored no lower than 150 on the Reasoning Through Language Arts Test, no lower than 150 on the Social Studies Test, no lower than 160 on the Science Test, and no lower than 170 on the Mathematics Reasoning Test. GED tests taken prior to 2014 must show a minimum composite score of 500+ (50+ on GED exams administered prior to 2002) with a minimum score of 410 on each GED subtest (41 on subtests administered prior to 2002). Applicants whose pre-2014 GED scores fall below these standards may qualify on the basis of a combination of GED and SAT Reasoning or ACT exam results:
    a) Applicants with GED composite score of 680+ with minimum 170 in each content area (50+ on tests administered before 2002; 500+ on tests administered until 2014) need to submit an official score report from the applicable state's department of education.
6. Public high school students must graduate from a standard or regionally accredited high school. Private high school students must graduate from regionally accredited high schools. Home-schooled students and graduates of unaccredited or non-standard high schools, as well as applicants who fail to meet the 15 subject requirements, may be admitted by submitting SAT Reasoning Exam score of 1000 on the Math and Critical Reasoning sections combined or an ACT composite score of 21 or better and a minimum score of 470 or above (940 total) on each of two College Board SAT Subject Tests (Math level I or IIC and another test of the student's choice, in a subject other than math).

Transfer Admission

A transfer student is one who has previously earned credits at another regionally accredited institution of higher education. A student must have earned at least 36 college-level credit hours (24 semester credits) to be admitted on the basis of his/her college record alone.

1. Transfer applicants must have a cumulative 2.25 GPA or better in college level classes unless they hold an Oregon Transfer Module (OTM) or an associate or bachelor's degree, in which case, a cumulative GPA of 2.0 is required.
2. In order to be admitted to Oregon Tech, transfer applicants must demonstrate proficiency in English and Math by completing the equivalent of Math 95 (Intermediate Algebra) or higher and WRI 115 (Introduction to Writing) or higher with grades of "C-" or better.
3. Applicants who do not have an Associate's or a Bachelor's degree must have at least 36 college-level credits. If more than 10 percent of an applicant's credits are in Physical Education, credits beyond the 10 percent threshold will not be counted toward meeting GPA requirements.
4. Applicants must be eligible to re-enroll in the previous institution attended.

Official transcripts from all post-secondary institutions must be submitted for consideration.

Applicants who have earned fewer than 36 quarter or fewer than 24 semester hours of college-level work must also provide high school transcripts or GED scores. They must also provide SAT I or ACT scores. In some cases, these applicants must submit SAT/ACT scores. Admission will be based on both high school and transfer GPA and subject requirements. Students who have completed fewer than 12 transferable quarter credits (8 semester) must meet freshman admission requirements. Students who have not completed 12 college credits within six months of graduating high school must submit the first-year application for admission.

Acceptance of vocational/technical courses may be granted after registration if the student's administering department finds that vocational/technical courses have satisfied certain bachelor's degree requirements. In all cases, course and/or department prerequisites will be enforced.

The transferability of credits earned at Oregon Tech is at the discretion of the receiving college, university, or other educational institution. Students considering transferring to any institution should not assume that credits earned in any program of study at Oregon Tech will be accepted by the receiving institution. Similarly, the ability of a degree, certificate, diploma, or other academic credential earned at Oregon Tech to satisfy an admission requirement of another institution is as the discretion of the receiving institution. Accreditation does not guarantee credentials or credits earned at Oregon Tech will be accepted by or transferred to another institution. To minimize the risk of having to repeat coursework, students should contact the receiving institution in advance for evaluation and determination of transferability of credits and/or acceptability of degrees, diplomas, or certificates earned.

Transfer Articulation Agreements

Oregon Tech is dedicated to enhancing partnerships with regional community colleges. One important way of doing this is by forming articulation agreements. An articulation agreement is an officially approved agreement that matches coursework between schools. These agreements are designed to help students make a seamless transition when transferring to Oregon Tech. Articulation agreements give students a clear understanding of what courses will transfer to Oregon Tech and satisfy requirements for their major while minimizing overlap or repeat of courses. Some agreements accept an associate's degree in its entirety while other agreements outline specific courses to take as a student plans for transfer. Students should inform the Admissions Office and their academic department advisor when they are utilizing an articulation agreement.

A list of articulation agreements can be found online at www.oit.edu/articulations; students may search by Oregon Tech major or by transfer institution. Questions regarding these agreements may be directed to the students' academic department or the Office of Academic Agreements.

Non-Admit Students

A non-admit is a student who wishes to enroll in no more than eight credits per term at Oregon Tech, is not seeking a degree from Oregon Tech and has never been fully admitted to Oregon Tech in the past. A non-admit is not eligible for financial aid. Out-of-state residents are subject to non-resident tuition and fees upon enrolling in more than 6 credits. A tuition and fee schedule can viewed on online (www.oit.edu/college-costs/tuition-fees). College-level classes taken while in non-admit status may be used toward Oregon Tech graduation requirements upon completion of the full admission process or may be transferred to other institutions. Enrollment as a non-admit student does not guarantee future admission to Oregon Tech. To enroll at Oregon Tech as a non-admit, submit the Non-Admit Application Form (www.oit.edu/applications) to the Admissions Office, at least one week prior to enrollment. Oregon Tech reserves the right to deny enrollment to those who seek non-admit status.

Admission to Programs Having Clinical or Practicum Requirements

It is important that prospective students understand that admission to those programs that have clinical or practicum requirements:

1. Is selective;
2. Will be granted after consideration of an applicant's ability to assume professional responsibility for clients, patients or students served by the program; and may be denied to any student with a record of past criminal behavior or psychiatric illness, which bears upon the student's ability to fulfill clinical or practicum responsibilities.

Students seeking admission to online degree completion programs in Radiologic Science, Vascular Technology, Echocardiography, Diagnostic Medical Sonography, or Respiratory Care, must meet all regular admission requirements and be registered professionals working in their chosen field. This will ensure access to clinical sites as required in these programs. For more information, contact the Online Education Office.

International Student Admission

Oregon Tech welcomes international students as applicants and as vital members of its campus community. In applying for admission, send the following to the Admissions Office:

1. An *International Student Application for Admission* accompanied by a $50 (U.S.) non-refundable fee.
2. Official transcripts, in English or with an accompanying official translation, of all high school and post-high school institutions attended.
3. Official test scores on the Test of English as a Foreign Language (TOEFL) or the International English Language Testing System exam (IELTS). A minimum score of 520 paper-based TOEFL, 190 computer-based TOEFL, 68 Internet-based TOEFL or 6 IELTS is required for consideration.
4. A completed *Statement of Financial Responsibility* form, indicating that you have the necessary financial resources in U.S. dollars to support yourself while enrolled.
5. A letter, if appropriate, from parents and/or sponsors indicating the amount of financial support they will provide in U.S. dollars.
6. Documentation showing that you, your parents and/or your sponsors have adequate financial resources to meet your expenses while enrolled at Oregon Tech. Examples include official bank statements, tax forms and letters of employment showing annual earnings.
7. An official credential evaluation from an Oregon Tech-approved credential service for all coursework completed at a post-secondary institution outside the United States. Examples include the Association of Collegiate Registrars and Admissions Officers (https://www.aacrao.org/resources/transfer-articulation) and World Education Services (www.wes.org).

A completed health history and immunization form must be submitted. In addition to the health requirements that need to be fulfilled before registration (refer to Integrated Student Health Center section of this catalog for health history and immunization requirements); international students must have at least one documented MMR vaccine on file at the Integrated Student Health Center prior to the student attending any classes (per OAR 333-050-0130). Also, students from countries identified as high risk for tuberculosis (most countries in Latin America and the Caribbean, Africa, Asia, Eastern Europe and Russia) are required to complete a TB screening upon entrance to Oregon Tech. This may include a TB skin test and/or a chest x-ray. This can be done at the Integrated Student Health Center if records are not available.

Exchange Student Admission

Oregon Tech welcomes exchange students through multiple exchange partnership agreements. Students at partner institutions work with an advisor at their "home" campus to meet the requirements of Oregon Tech's international exchange application process. It is recommended that exchange students begin the exchange application process at least nine months prior to the planned date of entry. This allows ample time for submission of documents that the U.S. Bureau of Citizenship and Immigration Services requires Oregon Tech to collect before we can issue the I-20 form that is used to secure an F-1 visa.

Admission Exceptions

The Admissions Committee and Director of Admissions retain the right to make exceptions to the specified requirements for admission or add stipulations to certain offers of admission. For additional information, contact the Director of Admissions.

Registration

Registration Events for new students occur prior to the start of each term. All students new to the Klamath Falls campus must participate in a Klamath Falls Registration program and all students new to the Portland-Metro campus must participate in Portland-Metro's Orientation & Registration program. In addition to placement testing and meeting with advisors to plan an academic schedule, students have the opportunity during Registration to register for classes, set up Oregon Tech computer and email accounts, receive a university ID card and learn more about making a successful transition to Oregon Tech. Students are encouraged to attend an early Registration event rather than waiting to register at the beginning of a term. Visit www.oit.edu/newwings or contact the Admissions Office at (541) 885-1150 or oit@oit.edu for more information.

Placement Testing

Oregon Tech's Student Success Center (SSC) administers all placement testing for Oregon Tech students. Student admission records are examined to determine placement requirements. Students transferring in math credit for calculus or beyond, or who have transferred in math credits to fulfill all of the math requirements for their major, are exempt from the math placement requirement. Transfer students with more than 36 transferable college credits are exempt from the reading placement requirement. Students transferring in college-level writing are exempt from the writing placement requirement. Entering students in health programs requiring Human Anatomy and Physiology with transferable college credit for this course are exempt from the entry

assessment for the Human Anatomy and Physiology course sequence. Placement tests are available prior to the term of entry and in conjunction with new student registration. Visit www.oit.edu/newwings or contact (541) 885-1791 or testing@oit.edu for more information.

Western Undergraduate Exchange

Students enrolled in some of Oregon Tech's majors are eligible for the Western Undergraduate Exchange (WUE) program. WUE is a tuition-reduction program sponsored by Western Interstate Commission for Higher Education (WICHE) that can save students from the Western United States thousands of tuition dollars each year. Students from Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, North Dakota, South Dakota, Utah, Washington, Wyoming, and Commonwealth of the Northern Mariana Islands are eligible. Students from these states who apply for WUE-eligible majors pay just 150 percent of the in-state tuition. No request is required to receive WUE. Students from WUE states who enter WUE-eligible programs will automatically be reviewed for WUE rates upon admission to Oregon Tech.

Eligible Programs

All majors in the College of Engineering, Technology, and Management, and
All majors in the College of Health, Arts, and Sciences except:

- Medical Laboratory Science
- Dental Hygiene and pre-Dental Hygiene
- Medical Imaging Technology and pre-Medical Imaging Technology
- Nursing after acceptance by Oregon Health Sciences University
- Paramedic Program

WUE is not offered for the Oregon Tech Online Education programs. WUE students are ineligible for the Presidential Academic Scholarship, although WUE offers the greater savings for non-resident students.

WUE Requirements

To maintain eligibility you must:

- Remain continuously enrolled throughout fall, winter, and spring of the academic year. Summer enrollment at Oregon Tech is not required to maintain eligibility.
- Enroll in at least 12 credits per term and maintain Satisfactory Academic Standing. Students who are simultaneously admitted to Oregon Tech and a community college to allow dual enrollment must take at least 9 credits per term from Oregon Tech with a combined total of 12 credits per term. GPA and completed credits are monitored each academic year.
- Students wishing to 'stop-out' of enrollment for a term must submit a written request to the Office of the Registrar before the start of that term. Requests are granted at the discretion of the university.
- Be seeking your first bachelor's degree

Financial Aid Programs and Application Process

College Union, 1st Floor
Klamath Falls
(541) 885-1280
dollars@oit.edu
www.oit.edu/faid

The Financial Aid Office is committed to providing high-quality service to all Oregon Tech students, and their families. Our office strives to provide information on a complex topic that enables students to make decisions regarding their educational funding.

The information contained in this catalog is general in nature and is not meant to serve as notification of students' rights and responsibilities as financial aid recipients. Oregon Tech's Financial Aid Award Guide serves that purpose. The *Award Guide* is available on our website at www.oit.edu/faid. Additional questions regarding the application process should be directed to the Financial Aid Office.

All students applying for federal financial aid must complete the *Free Application for Federal Student Aid* (FAFSA) available at www.fafsa.gov. A federally approved needs-analysis methodology is applied consistently to information provided by all applicants. The philosophy behind financial aid is that parents and students have the primary financial responsibility for funding the student's education.

If there are unusual financial circumstances that are not accurately reflected on the FAFSA, the student should contact the Financial Aid Office. Under certain conditions, professional judgment may be used and aid eligibility recalculated. The Financial Aid Office will always take the student's best interest into consideration while, at the same time, upholding federal regulations.

Veterans
Located in the Financial Aid Office in Klamath Falls, and the Registrar's Office in Portland-Metro, the V.A. Certifying Officials process enrollment certifications through the Veterans Affairs Regional Processing Center for students receiving education benefits. Oregon Tech complies with the Veterans Access, Choice, and Accountability Act of 2014 ("Choice Act") requirements for covered individuals and PL 115-251, section 301. These benefits allows eligible out-of-state veterans to receive in-state tuition rates.

Any student receiving G.I. Bill education benefits while attending Oregon Tech is required to obtain transcripts from all previously attended schools and submit them to the school for review of prior credit. This includes, but is not limited to: Joint Services Transcripts (JST), ACE-approved credits, DANTES, CLEP, CCAS, Service Members Opportunity Credit, etc. Refer to the Military Credit section of our catalog for more details. Good standing is an additional V.A. requirement. Any student that falls below satisfactory progress for more than one term will lose all veteran benefits until academic standing is improved to good standing. Please see Academic Suspension Policy.

As a Top Veteran-Friendly School (US Veterans Magazine), a 2019-2020 & 2020-2021 Military Friendly School TM, and a top school in the 2016 Military Advanced Education & Transition (MAE&T), Oregon Tech is committed to providing an exemplary experience for veteran students.

Veterans and dependents receiving education benefits, and military members who submit appropriate documentation have priority registration in order to achieve timely program completion.

Veterans and military members who are not receiving education benefits must submit a copy of one of the following pieces of documentation to receive priority registration:

- US Armed Forces Active Duty Orders
- DD214 under honorable or general conditions

Documentation must be received no later than the end of the 2nd full week of the term to receive priority registration for the upcoming term. For additional resources and information, please reference the veterans tab on the Oregon Tech website or see the V.A. Certifying Official.

Application Procedures/Priority Deadlines

All students applying for federal and state aid must complete the *Free Application for Federal Student Aid* (FAFSA) and list Oregon Tech's school code (003211). We encourage you to file as soon after October 1st as possible to be considered for your maximum eligibility. Some funds are very limited and are expended early.

Once the FAFSA information is received and reviewed by the Financial Aid Office, new students will receive a letter instructing them on how to log into "Tech Web" to view their award letter and the federally mandated shopping sheet online. Students may accept their aid online and request changes. Returning students will receive an email to their Oregon Tech email account when their award letter is ready to view online. *After accepting aid students must log back in to web for student and answer the Title IV authorization questions (24 hours later).* The Financial Aid Award Guide is located on our website at www.oit.edu/faid. It is important that students read the guide and follow the instructions on the letter they are sent.

Any updates/changes to award letters will result in an email to the student's Oregon Tech email account. If additional information is requested, such as tax transcripts or worksheets, students should return the documents as soon as possible to receive an *Offer of Financial Aid.* The award letter will list all types of aid for which the student is eligible. The *Award Guide* is a detailed booklet explaining programs, disbursement procedures and student rights and responsibilities, as well as cost estimates and other miscellaneous information. It is the student's responsibility as a financial aid recipient to become familiar with the contents of the *Award Guide* and contact the Financial Aid Office if additional questions or concerns arise. Additionally, students should check their **Oregon Tech email accounts** for announcements and notifications from Financial Aid regularly.

The *FAFSA must be filed for each year* a student wishes to be considered for financial aid eligibility.

Types of Aid

All federal and state programs are need-based with the exception of the Unsubsidized Stafford Loan and the Parent Loan for Undergraduate Students (PLUS). Students receiving federal aid are allowed to receive at maximum, the cost of attendance as determined by the Financial Aid Office through all aid programs, including outside benefits such as third-party payments. Individual financial-aid packages will vary based on determined cost of attendance, expected family contributions and outside resources.

Federal Pell Grants

The estimated maximum annual Pell Grant for **2020-2021 is expected to be $6,195**. Students may receive Pell Grants for less than full-time, but the grant will be prorated accordingly. Pell Grant eligibility is limited to those students who have not yet obtained a bachelor's degree or reached the lifetime limit of 600%. All students will be considered for Pell Grant eligibility if they file a FAFSA. Awards are granted based on the federally calculated expected family contribution (EFC).

Oregon Opportunity Grant

The annual Oregon Opportunity Grant award for 2019-2020 was $3,300. This grant program provides funding to Oregon residents in undergraduate programs attending Oregon schools. The Oregon Opportunity Grant is awarded by Oregon Student Access Commission. Students not enrolled full-time (at least 12 credits) **may be** eligible for a prorated part-time award if attending half-time. By filing a FAFSA, students are applying for this grant. Funds are available on a first come, first-served basis and are limited. A student can receive an Oregon Opportunity Grant for a maximum of 12 terms. More information is available at www.oregonstudentaid.gov.

Federal Supplemental Educational Opportunity Grants (SEOG)

SEOG funds are very limited at Oregon Tech, although priority for SEOG funds is given to zero EFC students. The typical award is $400 for an academic year. Only students who have not yet completed a bachelor's degree and are eligible to receive a Pell Grant will be considered for this grant.

Federal Work-Study Program

The Federal Work-Study Program allows students to earn money by working part-time on campus or at an off-campus community service site. Information regarding available jobs and application procedures are located in the Career Services Office and on the Oregon Tech Web site. Awards are usually $2,000 per year, which can be earned at any time during the academic year provided the student is enrolled at least half-time. Awards will be increased if money is remaining.

Direct Lending

Federal Stafford Loans (subsidized and unsubsidized) are available to most students through the federal government Direct Loan Program. Loan amounts vary based on student need and grade level in a declared major at Oregon Tech. A fee for guarantee and origination will be taken at the time of disbursement. Contact the Oregon Tech Financial Aid Office for current interest rates. The difference between a subsidized and an unsubsidized loan is that the federal government pays the interest on subsidized loans while the student is in school. Students who wish to borrow through the unsubsidized loan program should remember that interest is accruing on the loan. Interest payments can be made while in school and during the grace period, but are not required. Any interest that has accrued at the time of repayment will be capitalized. Students must complete entrance counseling and fill out a promissory note before funds will be disbursed. To complete these items go to www.studentaid.gov.

Matthews Loan, YATES Loan, and Oregon Tech Long Term Loan

The Matthews Loan, YATES Loan, and Oregon Tech Long Term Loan are loans offered by Oregon Institute of Technology. These loans have a five percent interest rate, no origination fee, and repayment begins six month (Matthews Loan), and nine months (YATES Loan and Oregon Tech Long Term Loan) after students cease to be enrolled at least half-time.

Students must complete a promissory note to receive the funds.

Federal Parent Loans for Undergraduate Students (PLUS)

Parents of dependent students can apply for funds through Parent Loans for undergraduate students. These loans are available for up to the cost of attendance minus other financial aid and resources each year. Interest begins to accrue immediately. An origination and guarantee fee will be taken at the time of each disbursement. Loan repayment begins 60 days after the final disbursement of the academic year. If you're a parent PLUS borrower, you can defer repayment of Direct PLUS Loans while the student for whom you obtained the loan is enrolled at least half-time, and for an additional 6 months after the student graduates or drops below half-time enrollment (half-time enrollment status is determined by your child's school). You must separately request each deferment period. This can now be set up in the application process.

Presidential Scholarships

First-time first-year applicants and transfers will receive consideration for Presidential Scholarships by applying and being accepted for admission by March 1st for the following fall term and meeting the minimum scholarship requirements. These scholarships are for full-time students, can be pro-rated if student is attending less than full-time, and may be renewed for up to four years. Award levels vary depending on each recipient's academic record. For more information, go to www.oit.edu/scholarships.

Klamath County Scholarship

The Klamath County Scholarship is automatically awarded to any applicant living in Klamath County who will attend Oregon Tech starting fall term after graduation from high school and who is able to meet the Presidential Scholarship criteria. Students must apply for admission, meet all admission requirements and be accepted for admission by March 1st for enrollment fall term. Recipients must be new full-time undergraduate students at Oregon Tech. This scholarship is valued at $1,000 and is NOT renewable.

Oregon Tech Foundation Scholarships

More than 200 new and returning students annually receive funding from scholarships administered by the Oregon Tech Foundation. Alumni, businesses, industry, and friends of Oregon Tech generously fund these awards. To receive consideration, students must be currently enrolled at Oregon Tech, or

accepted for admission for the following fall term. Application forms and deadlines are available on the Oregon Tech Web site at www.oit.edu/otfscholars. The online scholarship application process is seamless for students and automatically generates a list of scholarships the student is eligible to apply for. The winter application process opens in early December and has a deadline of March 1. There is a smaller process in the summer. Please contact Financial Aid for more information.

Leadership and Diversity Scholarships (LAD)

Oregon Tech awards Leadership and Diversity (LAD) Scholarships each year to students who meet the application criteria. Whether the applicant brings a diverse perspective to the Oregon Tech community and the applicant's history of involvement and leadership are two of the criteria considered when awarding this scholarship. LAD scholarship recipients are expected to fulfill ten service hours each term, providing leadership and/or promoting diversity in some way at Oregon Tech or in the community.

Leadership and Diversity Scholarships are $2,000 per year for Oregon residents or those attending under the Western Undergraduate Exchange, and $3,000 per year for non-residents.

Applicants must be accepted for admission by the Oregon Tech priority deadline and apply through the Oregon Tech Foundation scholarship application by March 1st. For more information visit www.oit.edu/scholarships.

Owls Scholarship

Any incoming first-year student who achieves 9 or more college credits in a science, technology, engineering or math course, with a grade of B or better, may apply for the Oregon Tech OWLS program. Applicants must have just finished high school and are applying for fall term admission; transfer students are NOT eligible. Scholarship award is $1,500 when college credits have been completed at Oregon Tech, and $1,000 if completed elsewhere. Students must be fully admitted and complete the scholarship application by March 1st. For more information visit www.oit.edu/scholarships.

Estimated Financial-Aid Budgets for 2020-2021 Academic Year

Financial aid budgets can include amounts for tuition and fees, books and supplies, room and board and miscellaneous expenses. Please remember that these are **estimated average costs for students**, and student spending habits will vary. On a very limited, case-by-case basis, the Financial Aid Office may be able to adjust a student's budget as permitted by federal regulations.

Students With Disabilities

Under certain circumstances, a student's aid package may be adjusted to reflect additional expenses. Please contact the Financial Aid Office if you would like additional information or to schedule an appointment.

Consortium Agreement Information

In some cases Oregon Tech's Financial Aid Office will process a paper consortium agreement with another school in order to allow a student taking courses at another institution to receive aid from one school for all eligible classes. The school must be one with which Oregon Tech does not have a dual enrollment agreement. The institution that will be awarding the degree and awarding financial aid is defined as the "home institution"; the "host institution" is defined as the institution from which the student is taking additional courses. Consortiums must be submitted before the end of the second week of the term.

When Oregon Tech is serving as the "home institution," the following criteria must be met to have classes at a "host institution" apply toward financial aid:

1. The student must be fully admitted to one of Oregon Tech's degree-granting programs and eligible for financial aid.
2. The student must be enrolled at least half-time (6 credits) at Oregon Tech
3. The classes taken at the host institution must be 100-level or higher.
4. The classes at the host institution must apply toward the student's Oregon Tech degree.
5. The classes taken at the host institution must not be offered by Oregon Tech during the term of enrollment.
6. The paper consortium must be received within the first two weeks of the term.

It is the student's responsibility to ensure that both the "host" and the "home" institutions complete the appropriate consortium agreement. Consortium-agreement forms are available at www.oit.edu/faid under "Awards." Students must provide Oregon Tech's Financial Aid Office with a final grade report from the "host institution" within 30 days of completing the course.

Dual Enrolled Students

Oregon Tech has formal dual enroll partnerships with multiple community colleges throughout the state. Please go online www.oit.edu/prospective-students/academic-agreements/dual-enrollment to view them.

Students who are dually enrolled may be able to combine credits at both schools for full-time enrollment. If Oregon Tech is the home school (giving aid) **the student must be enrolled in six credits at Oregon Tech**. Enrollment and grade information will be transmitted electronically. Credits at the host school need to be applicable to the Oregon Tech degree.

Residency

In Oregon, as in all other states, tuition at publicly supported four-year universities is higher for non-resident students than for resident students. The rules used in determining residency seek to ensure that only bona fide Oregon residents are assessed the resident fee. Please see www.oit.edu/registrar for the latest version of the residency policy.

Reciprocity Agreements

Students from some Northern California counties may be eligible to attend Oregon Tech under reciprocity agreements with College of the Siskiyous, College of the Redwoods, and Shasta College. Reciprocity can allow selected students to attend Oregon Tech at in-state tuition rates. Each participating

college has certain restrictions, which may include the county of the student's residence, required enrollment for a period of time first at the community college, the student's major, and how many reciprocity permits the college issues. Please contact the California colleges for more information.

Tuition and Fees

Snell 116
(541) 885-1202

Fees and deposits at Oregon Tech are charged according to a uniform plan, varying on the nature of coursework offered. Oregon Tech reserves the right to make changes in fee schedules without notice.

Below is a partial list of the estimated fees paid by students regularly enrolled for undergraduate and graduate study.

For a list of on-campus fees (Building Fee, Incidental Fee, Health Service Fee, Student Recreation Center Fee, and International Insurance) that are dependent on number of credits enrolled and are charged on a term-by-term basis, see the "Tuition and Fees by Program" PDF on the Oregon Tech Website (https://www.oit.edu/college-costs/tuition-fees). Payment of full-time fees entitles students to use the library. Students may receive medical attention from the Student Health Center, use the fitness center (TechRec) and other student services. No reduction in fees is made for students who do not wish to access these services.

The estimated fee schedule for the 2020-21 academic year is provided for planning purposes only. Fees are subject to change. The current fee schedule is available from the Business Affairs Office or on the Oregon Tech website.

Special Fees

All special fees are subject to change without notice.

Application Fee (Non-refundable) - $50

Must be paid at the time of application submission for admission to Oregon Tech.

Differential Tuition - Allied Health

Tuition is assessed as the base tuition rate plus 30 percent for students enrolled in Allied Health programs.

Differential Tuition - Engineering and Technology

Tuition is assessed as the base tuition rate plus 30 percent for students enrolled in Engineering and Technology programs

Interest - Annual rate of 12%

Periodic rate of interest is one percent per month, or fraction thereof, of the unpaid balance remaining on the account at the time statements are ran (around the middle of each month – see the Cashier's Calendar at https://www.oit.edu/faculty-staff/ba/ar/cashiers-office for exact statement dates).

Late Payment Fee - $99

Students paying fees after scheduled payment due dates for any term will be charged a late fee of $99.

Late Registration Fee - $20

A fee of $20 is charged to students registering for classes after the second week of each term.

Lifetime Transcripts (Non-refundable) - $40

A one-time fee assessed to all new and transfer students for lifetime paper official transcript requests. Additional fees may apply for expedited shipping of paper official transcripts. Additional fees apply for PDF Official Transcripts please see PDF Transcript section of this listing.

PDF Transcript - $15

A fee of $15 is charged for each electronic PDF official transcript requested.

Malpractice Fee - $6

A malpractice fee of $6 is charged to all on-campus students that are in majors in the following departments: Medical Lab Sciences, Emergency Medical Services, Respiratory Care, Dental Hygiene, and Medical Imaging Technology. This fee covers malpractice insurance.

Matriculation Fee (Non-refundable) - Undergraduate $315; Graduate $165

A one-time fee assessed to all new on-campus Oregon Tech students. The Matriculation Fee covers orientation, testing, first-year experience and peer consulting for all students.

Matriculation Distance Education Fee (Non-refundable) - $50

A one-time fee assessed to all new Oregon Tech Distance Education students.

Online Tech Fee - $65

Fee of $65 charged per distance education or hybrid course. This fee covers the cost of technology to deliver a course online or partly online.

Parking Fees

All student, staff and faculty vehicles for the Klamath Falls campus must be registered with Parking Services and operated in compliance with *Regulations Governing Traffic Control*. At the time of vehicle registration, a parking fee will be assessed in accordance with a schedule approved by the President of the University and approved by the Oregon Tech Board of Trustees. Parking permits may be purchased online via TECHweb. Vehicles must be registered by the first day of classes. Parking Fees for 2020-21 are:

Students	Faculty/Staff	Permits-Additional Vehicles
$109/year	$172/year	$10 fee for additional vehicles for one-term and full-year permits
$54.50/term	$86/term	(This fee allows up to four vehicles per permit. Only one vehicle is allowed on campus at a time.)

Petition to Graduate Fee - $56
A fee of $56 is charged on the Oregon Tech student account after the student has submitted the Petition to Graduate form. Please contact the Registrar's Office with question regarding this fee.

Returned Check or Electronic Payment Fee - $25
If payments to a student account are made by check or electronic payment and are returned because of any irregularity, the student becomes responsible for a $25 Returned Check or Electronic Payment Fee that will be charged on their student account. A Late Payment Fee will also be added to the student account for unpaid balances resulting from a returned check or electronic payment.

Room and Board Costs
The 2020-21 estimated annual room-and-board costs range from $9,231 to $10,530 depending on room type and meal plan purchased. Room-and-board charges are assessed by term. Fees are due in accordance with the same fee payment schedule as exists for tuition. Payments are due at the end of the second week of the term (unless a payment plan has been arranged with the Cashier's Office – please see detail and due dates on the Oregon Tech Cashier's webpage).

Senior Citizen Instruction Fee
Senior citizens are persons age 65 or older. Such persons are authorized to attend classes on a space available basis. Charges for special materials (any extra class fees), if any, do apply. The senior-citizen privilege is extended to persons auditing classes only (not seeking credit or working toward a degree).

Per-credit hour: There is no charge for tuition and on-campus fees (Incidental, Health Service, Building, and Student Recreational Center Fees), therefore incidental fee privileges are not provided.

Service Charge – Payment Plan - $10
A $10 service charge per term is assessed on accounts using the payment plan. See the Student Financial Responsibility Agreement (found on the Cashier's website https://www.oit.edu/faculty-staff/ba/ar/cashiers-office) for more details on payment plan requirements.

Special Course Fees, per course
Special Course Fees, fees in addition to regular tuition, are assigned for some courses. These fees are noted in the *Schedule of Classes* for each term. These fees cover required consumable materials for the course that the institution purchases for students for more competitive pricing or because of better availability to the institution than to individuals.

Special Examination Fee, per credit - $50
Examination for credit.

Tuition and Fee Refunds
Students who withdraw from the university and who have complied with the regulations governing academic withdrawals may be entitled to certain refunds of tuition and fees assessed, depending on the time of withdrawal. The refund schedule has been established by the Oregon Tech Board of Trustees and is on file in the Business Office. Included with the refund schedule is the mandated order in which financial aid must be returned to the appropriate programs for students receiving financial aid. All refunds are subject to the following regulations:

- Tuition and Fee Refund Appeal forms must be submitted to the Business Affairs Office no later than 90 days after the last day of the term in which the course(s) was dropped.
- An official notice of withdrawal must be completed and necessary clearance signatures filed with the Registrar's Office.

Refunds in all cases are calculated from the date of receipt of the application for refund or date of withdrawal, and not from the date when the student ceased attending classes, except in unusual cases when formal withdrawal has been delayed through cause beyond the student's control.

Library Fines and Charges
The following regulations govern library fines and charges:

1. **Books**–A fine of 25 cents per day is charged for each item overdue other than reserve books. No charges are made for the first three days late, but a charge of $1 is assessed on the fourth day, plus 25 cents per day thereafter (maximum, $10 each item). Separate charges apply to books borrowed from other libraries.
2. **Billing**–Borrowers failing to return materials within 40 days of the due date will be charged the replacement cost of the items plus the amount of fine (maximum fine-$10 each item) incurred up to the time the item is reported missing. In addition, the borrower will be assessed a service charge of $10.
3. **Refunds**–When a lost item for which the borrower has been billed is returned before replacement has been ordered, a refund not exceeding the replacement cost may be made at the discretion of the librarian. In cases where replacement has been ordered, no refunds to the borrower will be made.
4. For Alliance and ILL items, fines accrue until the item is returned, with no set maximum. Replacement charges for Alliance items are $75, plus a $20.00 processing charge, plus a $15.00 billing charge for a total of $110.00 for each Alliance item not returned. Replacement charges for ILL items are established by the lending library, and will include a $20.00 processing charge, plus $15.00 billing charge, for each ILL item not returned.

38 U.S.C. 3679(c). Veterans Access, Choice, and Accountability Act of 2014

A student is entitled to pay tuition and fees at Oregon Institute of Technology at the rates provided for Oregon residents without regard to the length of time the person has resided in this state if the student resides in this state while enrolled in the institution and the student:

1. Is receiving Chapter 30: Montgomery OR Chapter 33: Post-9/11 GI Bill educational assistance; and
    - Enrolls within 3 years of discharge after serving 90 days or more on active duty; or
    - Anyone using transferred entitlement within 3 years of the transferor's discharge after serving 90 days or more on active duty; or
    - Surviving Spouses or Children under the Fry Scholarship who enroll within 3 years of an active duty Service member's death in the line of duty after serving 90 days or more; or
2. Students who remain continuously enrolled after initially meeting the requirements and are using Montgomery and Post-9/11 GI Bill educational assistance.

Academic Policies and Procedures

Procedures and Regulations

Student Responsibility

Students are responsible for knowing and understanding Oregon Institute of Technology's requirements relating to registration, academic standards, student activities and student organizations. A partial view of academic regulations is included in the class schedule introduction pages on Oregon Tech's Web site and distributed to new students during their first registration at Oregon Tech. Students are encouraged to meet regularly with their departmental advisors and to contact the Registrar's Office with questions about academic procedures, policies or regulations.

Academic Advising

Students are assigned faculty advisors from their academic programs. Advisors maintain a file on students' progress and help them plan course loads. If a student should change programs, a new advisor will be assigned. Degree-seeking students are required to meet with their advisors prior to registration.

Student Classification

Students are classified according to the number of college-credit hours earned as follows: 0-44, freshman; 45-89, sophomore; 90-134 junior; 135 and above, senior. Transfer credits are included in determining classification.

Quarter System

Oregon Institute of Technology operates on an academic year consisting of three quarters (or terms) of approximately 10 weeks each and a summer session of eight weeks.

Academic Progress and Petitions Committee

Administration of the regulations governing academic requirements is vested in the Academic Progress and Petitions Committee. This committee also has authority to assess probation or to suspend any student from the university when it appears that the student's work is at such a level that the student cannot benefit by continued attendance. The university requires that students make substantial progress toward meeting graduation requirements, including maintaining a minimum 2.0 GPA. Any cumulative GPA below 2.0 is considered unsatisfactory and will bring the student's record under review. Courses transferred in from other institutions are not included in institutional cumulative GPA.

The Academic Progress and Petitions Committee also serves as an advisory group to the Registrar's Office regarding academic appeals. For information regarding appeals to this committee, students may contact the Registrar's Office.

Admissions with Special Conditions

If a student is admitted with one or more stipulations and fails to meet any of the prescribed condition(s), that student may be referred to the Academic Progress & Petitions (AP&P) Committee for possible academic disciplinary action, up to and including probation and suspension from the university. The request for review by AP&P can be made by any member of the Admission Committee.

Academic Warning

An academic warning is a caution to the student that there is a lack of satisfactory academic progress. Students, including first term freshmen, who do not achieve a 2.0 in any given term will receive an Academic Warning. Students who have no earned credits, withdrawals (i.e., all Fs, withdrawals (W) and/or incompletes (I)), for two consecutive terms will also receive an Academic Warning.

Academic Probation

Students who have attempted two or more terms at Oregon Tech and have an Oregon Tech cumulative GPA below 2.0 will be placed on Academic Probation. Students who have no earned credits, (i.e. all Fs, withdrawals (W) and/or incompletes (I)), for three or more consecutive terms will also be placed on Academic Probation. Students placed on probation will receive notification that they are on Academic Probation as well as instructions on how to proceed. Once placed on probation, students are advised to limit their course load to 13 credits. Courses transferred in from other institutions are not included in institutional cumulative GPA.

Academic Suspension

Students on academic probation for one term who do not meet the 2.0 cumulative GPA requirement in the successive term of enrollment will be placed on Academic Suspension for at least one term. To re-enroll, a student must complete the prescribed procedures and appeal to the Academic Progress and Petitions Committee for reinstatement. Students should contact the Registrar's Office for re-enrollment information. Students who have been suspended are denied all privileges of the institution.

Veteran students receiving benefits will lose all benefits until academic standing is improved to good standing.

NOTE: When a student is placed on academic warning, probation or suspension both the student and their advisor will be notified.

Academic Forgiveness

The Academic Forgiveness policy allows undergraduates with an unsatisfactory GPA to drop a maximum of three consecutive terms of work from consideration in their GPA. Academic forgiveness applies to terms only. Students are not allowed to select courses within terms for forgiveness. Academic forgiveness is granted on a case-by-case basis by the Academic Progress and Petitions Committee. It is an extreme measure; it may be granted only once and only when a student provides clear and convincing evidence of a renewed commitment to advancing his or her education. Once forgiveness is granted, it may not be revoked. Forgiveness can be applied only to credits earned at Oregon Tech.

If the petition is approved, the student's transcript will have a notation stating, "Academic Forgiveness Granted" above each term in which forgiveness was granted. Forgiven courses and grades are no longer calculated in the GPA and do not apply toward graduation. However, a record of all coursework will remain on the transcript.

Eligibility

To apply for consideration for academic forgiveness a student must:

1. Have earned less than a 1.0 term GPA for the term(s) being considered for forgiveness. The term(s) for which forgiveness is being requested must have been taken at least seven years prior to the request
2. Have had at least a two-year lapse in enrollment at Oregon Tech
3. Be currently enrolled at Oregon Tech
4. Have completed a minimum of 30 graded credits at Oregon Tech with minimum cumulative GPA of 3.0 or better since resuming studies at Oregon Tech
5. Apply for forgiveness with the Academic Progress and Petitions Committee before degree completion

Procedure

To apply for academic forgiveness, a student must submit a formal letter of request to the University Registrar, which must include:

1. Specific term(s) (maximum of three consecutive) for which forgiveness is being requested
2. Statement of academic goals and a term-by-term plan for degree completion signed by the student's academic advisor
3. Rationale for the request

The University Registrar will forward the application to the Academic Progress and Petitions Committee for review and will notify the student of the Committee's decision.

Summer Term

Anyone may enroll in summer term. Formal admission to the university is not necessary and there are no GPA or high school diploma requirements. High school students who want to take college courses are invited to attend. Potential students who have not met the college entrance requirements may take appropriate courses during the summer to correct these deficiencies. Students may register from early May through the first day of summer school. Tuition is on a per-credit basis.

The eight-week term begins in mid-June and ends in mid-August. Four-week sessions begin in mid-June and mid-July. Classes meet Monday through Thursday and are scheduled either during day or evening hours. Many summer classes are offered online via Oregon Tech Online.

A separate summer term class schedule is available on the web in April. This schedule provides a listing of courses, fees, registration and housing information.

Advanced Standing

Credit for Prior Learning

Credit for prior learning by a student admitted to Oregon Tech may be granted through a number of independent processes. These include:

1. Transfer Credit
2. Military Credit
3. College Level Examination Programs (CLEP) and Advanced Placement credit (AP)
4. Credit for National Registry or Licensure Exams
5. Credit by Examination and
6. Credit for Prior Experiential Learning

A number of these categories are for credit that is awarded for educational accomplishments attained outside of accredited post-secondary institutions. These procedures describe the process used to grant the student appropriate academic credit by each of these methods as follows:

A. Transfer Credit

Oregon Tech makes every effort to give maximum consideration to the transfer work presented by enrolling students. To ensure that the student has the requisite knowledge, Oregon Tech follows these policies in determining credit:

Accreditation Status of Institution

The institution where the transfer credit was earned must be accredited by a regional accrediting body recognized by the Council for Higher Education (CHEA).

Students transferring work from an institution that is not regionally accredited by a CHEA-recognized accrediting body may receive transfer credit by:

1. demonstrating prior experiential learning with a portfolio
2. applying for credit after demonstrating competencies in advanced coursework in the same subject area or
3. challenging courses by exam

International Institutions

Students seeking transfer credit from international institutions must provide Oregon Tech with a credential evaluation from an Oregon Tech-approved credential evaluation service. Credential evaluation information may be obtained from the Office of Admissions. The credential evaluation must include course titles, credits and grades. Students must also provide course descriptions in English from the international institution. Any associated costs are the responsibility of the student.

Official Transcripts

Prior to the formal awarding of transfer credit, the transfer student must provide an official transcript of coursework completed at all other higher education institutions. Failure to list all colleges attended on the Application for Admission may result in denial of admission or transfer credit.
Admitted transfer students must submit official transcripts at least one term prior to enrollment to ensure timely evaluation of transfer credits.
Any student receiving GI Bill education benefits while attending Oregon Tech is required to obtain transcripts from all previously attended schools and submit them to the school for review of prior credit.

Determination of Transfer Credit
The Oregon Tech Registrar's Office determines the transfer equivalency of general education courses using articulation agreements, course descriptions, course outlines, and course syllabi. The student's major department determines the transfer equivalency for technical or major courses using similar resources.

Articulation Agreements
Oregon Institute of Technology is dedicated to enhancing partnerships with regional community colleges. One important way of doing this is by forming articulation agreements. An articulation agreement is an officially approved agreement that matches coursework between schools. These agreements are designed to help students make a seamless transition when transferring to Oregon Tech. Articulation agreements give students a clear understanding of what courses will transfer to Oregon Tech and satisfy requirements for their major with the least overlap or repeat of courses. Some agreements accept an associate degree in its entirety while other agreements outline specific courses to take as a student plans for transfer. Students should inform the Admissions Office and their academic department advisor when they are utilizing an articulation agreement.

A list of articulation agreements can be found online at www.oit.edu/articulations; students may search by Oregon Tech major or by transfer institution. Questions regarding these agreements may be directed to the students' academic department or the Office of Academic Agreements.

Applicability of Transfer Credit
Oregon Tech provides a report upon the admission of the student, prior to the planned term of enrollment. The evaluation delineates the transfer credit on a course-by-course basis and specifies direct course equivalencies, courses which may be used towards general-education requirements, elective credits and courses which do not receive credit.

At the time of admission, Oregon Tech's report may include elective credits that do not apply towards a specific degree. These credits will be recorded as transfer credit for registration purposes, allowing the student an earlier registration appointment based on total earned credit hours.

Some transfer work, which may not be directly equivalent to Oregon Tech courses, may be appropriately substituted to meet Oregon Tech requirements. Students may seek course substitution approval by completing the Course Substitution form and obtaining the signature of the advisor, department chair and University Registrar.

Credit for Alternative-Delivery Courses
Courses taken by alternative delivery from other accredited institutions will be evaluated as transfer credit.

Minimum Grade Standards
Oregon Tech considers for transfer those courses that carry a grade of D or better from an accredited institution. However, many Oregon Tech departments require C or better course grades for prerequisite and graduation purposes. Oregon Tech does not normally transfer math courses with a "D" grade.

Pre-College Level Transfer Credit
Oregon Tech students who plan to enroll at other institutions during the summer or to complete coursework for the degree in absentia are encouraged to obtain written pre-approval of transfer credit to ensure transfer equivalency for degree purposes.

Pre-Approval of Transfer Credit
Oregon Tech students who plan to enroll at other institutions during the summer or to complete coursework for the degree in absentia are encouraged to obtain written pre-approval of transfer credit to ensure transfer equivalency for degree purposes.

B. Military Credit
Oregon Tech will grant credit for military courses and experiences based on American Council of Education (ACE) guidelines (found in the Guide to the Evaluation of Educational Experience in the Armed Forces) and faculty recommendations. Credit is awarded in accordance with transfer credit policies at Oregon Tech and the Oregon University System. Students may request evaluation of military credit by furnishing an official AARTS or SMART transcript.

C. College-Level Examination Programs and Advanced Placement: College Level Examination Program (CLEP)
Oregon Tech will award credit for several college-level examination programs. These examinations must be completed with a satisfactory score and an original copy of test results must be forwarded to the Registrar's Office from the testing service. In order to receive such credit, the student must be admitted to an Oregon Tech degree program and registered for classes during the term in which the request is made. Oregon Tech awards credit for College-Level Examination Program (CLEP) subject examinations, but not for CLEP general examinations. Information on CLEP course equivalencies and minimum scores may be obtained from the Oregon Tech Registrar's Office.

Advanced Placement (AP)
Students who complete college-level work in high school under the Advanced Placement (AP) program must achieve a minimum score of three to be granted credit on their Oregon Tech transcript. AP course equivalences may be obtained from the Office of Admissions or Registrar's Office.
A maximum of 25 percent of the credits used toward the degree may be CLEP and AP.

International Baccalaureate
Oregon Tech evaluates IB test scores much in the same way it evaluates AP scores. Students must have official test scores sent to the Office of Admissions. Oregon Tech may award credit to students who receive a 5 or higher on any Higher Level IB examination. For more information, please contact the Registrar's Office at (541) 885-1300.

D. Credit for National Registry or Licensure Exams

Oregon Tech will award a pre-approved block of credit to fully admitted and enrolled students who have passed a national registry or licensure exam in majors offered by the institution. This award of credit is based on the academic department's annual review of the national exam questions in comparison to the curriculum taught on campus. Full information is maintained in the Registrar's Office and via Oregon Tech Online, which coordinates online degree-completion programs offered by Oregon Tech.

Credit by Examination and Credit for Prior Experiential Learning

Oregon Tech awards credit for educational accomplishments attained outside of accredited post-secondary institutions.

E. Credit by Examination

Students currently enrolled at Oregon Tech may request credit for a course by special examination. This process is called a course challenge and the provisions are:

1. Credit by examination (course challenge) is available to students who are fully admitted in degree-granting programs
2. Students may not challenge a course which they have previously taken for credit and received a grade other than an audit, nor may they challenge the same course more than once. If students register for a course they wish to challenge, they must drop and challenge the course before the last day to drop without a "W"
3. No more than 25 percent of the credits submitted for graduation may be credit by examination
4. Examinations receive either a "P" (pass) or "F" (fail). A pass suggests the student has mastered the material comparable to a grade of "C" or better in the course being challenged. The University Registrar records "P" grades on the student transcript, but does not count the P in grade point average calculations. The University Registrar does not record "F" grades
5. Students must pay a non-refundable per-credit fee, as published by the Office of Business Affairs, prior to the examination
6. Departments are responsible for preparing an appropriate examination, evaluating the student's response and submitting results to the Registrar's Office. Departments reserve the right to declare any course offering as non-challengeable

Further procedures and general guidelines for course challenges may be obtained from the Registrar's Office.

F. Credit for Prior Experiential Learning

Oregon Institute of Technology recognizes that students learn outside the classroom through experiences on the job, vocational education, professional development courses, workshops, and independent study. Oregon Tech may grant credit for experiential learning when it is judged to be equivalent to college-level courses in the Oregon Tech curriculum. This process is only appropriate for students who wish to demonstrate learning for more than one required course. Typically, credit for experiential learning will replace a series of major specific courses.

Level of Credit

Oregon Tech grants credit for prior experiential learning at the undergraduate level only. Credit will be awarded only for documented prior learning that has a balance, appropriate to the subject, between theory and practical application, and not just for prior experience. Credit should be appropriate to the academic context in which it is accepted.

Eligibility Requirements

The student must be fully admitted and enrolled at Oregon Tech. Credit will not be granted until the student has successfully completed the procedure outlined. Credit for prior experiential learning will not be granted if the student has already received credit for the same course. No more than 25 percent of the credits needed for a degree or certificate may be from credit for prior experiential learning. Credit may only be granted for courses offered by Oregon Tech and the university reserves the right to declare any course offering as inappropriate for prior experiential learning credit.

Awarding of Credit

Completion of the institution's review process does not guarantee a student will receive credit for prior experiential learning. If the student successfully demonstrates evidence of college-level learning, credit will be identified on the student's transcript as credit for prior learning. This credit will not be graded or counted in the student's grade point average. Students wishing to appeal the award of credit should appeal to the Provost, whose decision is final.

Tuition and Fees

Fees charged for portfolio assessment are based on the services performed. The application fee for a specified course is published by the Office of Business Affairs. This non-refundable fee must be paid prior to submitting the portfolio for assessment. Proof of payment must accompany the student's Credit for Prior Experiential Learning Application.

Transfer of Prior Experiential Learning Credit

Oregon Tech accepts credit for prior learning from other institutions, provided that the transfer institution awards such credit on the basis of standards similar to those outlined by the Northwest Association of Colleges and Universities (NWCCU).

Faculty Evaluator Qualifications

Credit is awarded based on the recommendation of teaching faculty who are qualified in the subject area, who have adequate training in portfolio evaluation and who are on regular appointment with the university on a continuing basis.

Procedure

Students seeking credit for prior experiential learning should first confer with their advisor to help assess if their experience and learning are appropriate for this process. If it is determined that experiential learning assessment is appropriate, the student should contact the University Registrar.

The University Registrar will determine whether the student has met the eligibility requirements outlined in this procedure. If so, the University Registrar and the Department Chair will sign the student's Credit for Prior Experiential Learning Application. The student must then complete a prior experiential learning documentation course. This course may be utilized for curricular requirements by the major department if appropriate.

Upon completion of the documentation course, the student will submit his/her Credit for Prior Experiential Learning Application and completed portfolio to the appropriate faculty evaluator as determined by the department chair. The faculty member will review the portfolio and if necessary will interview the student. Review of the portfolio will ensure that the learning experience demonstrates the theories, competencies, and outcomes of the academic subject matter. When appropriate, the faculty member may choose to consult with others who have expertise in the subject matter before making a decision as to whether or not to grant credit. The final decision is recorded on the student's Credit for Prior Experiential Learning Application and will be forwarded to the University Registrar. The Credit for Prior Experiential Learning Application will be included in the student's permanent academic record. The portfolio will be retained in accordance with Oregon Tech's archive guidelines.

Catalog of Graduation

The student must meet all degree requirements from one Oregon Tech catalog. The catalog may be chosen from the year the student is first admitted and enrolled at Oregon Tech or from any subsequent year. However, at the time of graduation, all students, including transfer students, must use a catalog that is not more than seven years old.

Transfer students may select their catalog of graduation prior to full admission to Oregon Tech by obtaining written approval from their Oregon Tech major department and the University Registrar. The agreed-upon catalog will be the one a student uses when he/she transfers to Oregon Tech. Students must enroll at Oregon Tech within two years of this approval.

Departments periodically review their curriculum for technical currency. As a result, significant program changes may occur. Courses previously required in the curriculum may no longer be offered. The major department will provide a transition plan for students to fulfill degree requirements. Programs discontinued by the university may have specific entrance and graduation limits that override this catalog-of-graduation policy.

Baccalaureate Upper-Division Credit Requirement

Baccalaureate students must complete a minimum of 60 credits of upper-division work before a degree will be awarded. Upper-division work is defined as 300- and 400-level classes at a bachelor's-degree-granting institution.

Grading System

Student academic achievement is evaluated and reported in accordance with a system of letter grades assigned at the end of each course. These grades become part of the student's transcript, a permanent academic record. A summary statement of a student's total academic record is expressed as a cumulative grade point average (GPA).

Grading Policy

Oregon Tech uses a 4.0 grading scale to evaluate student performance. Upon completion of a course or upon termination of attendance in the course, a student's performance will be graded by the instructor and reported to the University Registrar as follows:

Letter Grade	Meaning	Points Per Credit Hour	Used to Calculate GPA
A	Exceptional	4	Yes
B	Superior	3	Yes
C	Average	2	Yes
D	Inferior	1	Yes
F	Failed	0	Yes
I	Incomplete	0	No
IP	In Progress	0	No
N	Audit	0	No
NP	No Pass: *Equated to a "D" or "F"*	0	No
P	Pass: Equated to a "C" or better	0	No
W	Withdrawn	0	No
Z	No Grade Assigned	0	No

Grade Point Average

A student's GPA is computed by assigning a numerical point value to each grade: "A," 4 points per credit; "B," 3 points per credit; "C," 2 points per credit; "D," 1 point per credit; "F," 0 points per credit. GPA at Oregon tech is truncated. GPA is the quotient obtained by dividing total grade points by total hours attempted. Grades of "I", "P", "NP", "W" and "N" are disregarded in calculating GPA; however, a "P" is equivalent to a "C" or better. For example:

Class #	Title	Credits	Grade	Point Value for Credits	Earned Grade
WRI 121	English Composition	3	B	3	9
ECO 201	Economics	3	C	2	6
MATH 111	College Algebra	4	A	4	16
CHE 101	Elementary Chemistry	3	B	3	9
CHE 104	Elementary Chemistry Lab	1	B	3	3
HED 250	Contemporary Health Issues	2	A	4	8
PHED 190	Racquetball	1	B	3	3
Total					**54**

GPA = Sum of earned grade points = $\frac{54}{}$ = 3.1764 or 3.17; credits attempted: 17

Grade Change Policy

All grades except for 'I' and 'IP' are final when filed by the instructor during grade processing each term. Thereafter, a grade change may be made only in the case of clerical, procedural or calculation error. No grade other than 'I' or 'IP', once reported, may be revised by re-testing or by completing additional

work. Any grade change by the instructor of record must take place within one year subsequent to the term in which the grade was reported. Any grade change that is to be filed later than one year must be approved by the appropriate College Dean and the University Registrar.

Non-Standard Grading
Courses may be graded on the pass (P)/no pass (NP) basis at the discretion of the department and the University Registrar. Courses may include, but are not limited to seminars, externships, co-ops, independent study, certificate classes, and physical education.

Class Drop/Withdrawal Policy
A student may drop/withdraw from a course through Friday of the seventh week of the term. Although teaching faculty may drop a student during the first two weeks of the term, according to the Faculty Initiated Withdrawal Policy, they are not required to do so. Students will be notified of instructor initiated drops in writing.

Faculty-Initiated Withdrawal Policy
Teaching faculty can drop a student during the first two weeks of the term from a class if the student has not attended by the second regularly scheduled meeting of that class. The student will be notified of the withdrawal in writing by the Registrar's Office.

Student Initiated Drops/Withdrawals
1. During the first 10 days of the term, a student may drop one or more courses with no record. However, if a student withdraws from all courses, the student's transcript will note "Complete Withdrawal"
2. After the first 10 days of the term, a student who withdraws from one or more courses will receive a "W" for those courses. Students may withdraw from individual courses through Friday of the seventh week of the term
3. After Friday of the seventh week, students will receive a letter grade ("A", "B", "C", "D", "F", "P", "NP", "I" or "IP") from the instructor
4. Complete withdrawals from the university may be processed through Friday of the week prior to final-exam week. Depending on the time of the term, a complete withdrawal will result in a notation of a "complete withdrawal" or "W's" on the student's transcript
5. Students requesting to withdraw from a course(s) after the published withdraw dates that have medical documentation supporting the withdraw should contact the **Dean of Student's Office**

NOTE: The deadlines for dropping/withdrawing from a course are listed in the Academic Calendar.

Incompletes
When the quality of a student's work is satisfactory, but some essential requirement of the course has not been completed for reasons acceptable to the instructor, a grade of Incomplete (I) may be assigned and additional time granted for completion. The instructor is responsible for submitting an "I" grade and completing the Request for Incomplete form and submitting it to the Registrar's Office.

An "I" grade must be removed by the end of the next term (summer session not included). An "I" may only be extended under the most extenuating circumstances and then only for one additional term. If an "I" is not removed within the allotted time, the "I" then reverts to the alternate grade assigned by the instructor on the incomplete form.

Incompletes received in the anticipated term of graduation must be finished and the grades recorded in the Registrar's Office within three weeks after the end of the final term. Otherwise, the diploma will be delayed until the term during which all degree requirements are met.

In Progress (IP) Grade
The "In Progress" grade is used for classes with coursework that continues past the end of the term in which the student is registered. Examples include externship, co-op, clinical and project classes. The "IP" grade may be retained over multiple terms. "IP" grades that are not changed during the allotted time revert to a grade of "F" for undergraduate and graduate courses.

"IP" grades given at the undergraduate level will be retained for a maximum of four terms. The "IP" grade for a specific graduate level course is maintained by the Registrar's Office for a maximum of five years. Each year the student should file a progress report with the Graduate Council signed by the student and the student advisor. After five years, the student can appeal to the Graduate Council to request a grade change beyond this five-year limit. The Graduate Council has the authority to approve or deny the student's petition.

No Grade Assigned (Z) Grade
The "No Grade Assigned" grade is a grade assigned by the Registrar's Office when no grade is reported by the instructor. A "Z" grade should be changed by the instructor as soon as possible. If a "Z" is not removed by the completion of the following term, the "Z" reverts to a grade of "F".

Repeat Policy
The following restrictions apply for course-repeat situations:
1. Students may attempt the same course (for a "W" or a letter grade) a total of four times
2. Each withdrawal ("W") is considered an attempt. Withdrawals, however, are not included in GPA calculations
3. The new grade earned will replace the previous grade(s) when computing GPA. Only the first two earned grades will be excluded for GPA calculations. The last grade earned will be used on the petition to graduate
4. All grades and credits remain on the student's official transcript

NOTE: Students should consult with their financial aid counselor to determine financial eligibility for repeat courses.

Auditing Policy
A student has the option to enroll in a class for informational purposes only. This enrollment is classified as an audit and is regulated by the following procedures:
1. Audit classes are charged at regular tuition rates as printed in the class schedule

2. The only grade an audit class may be granted is "N" (audit). The "N" grade is disregarded in the GPA and is not valid toward graduation requirements
3. Class attendance shall be in accordance with the instructor's attendance policy for all students in the class
4. Instructors having audit students have no obligation to grade or record the audit student's work
5. An audit option may be requested during the registration period. Changes "to" or "from" the audit option may be requested no later than the 10th academic day of the term
6. Students auditing a course may, at a later term:
    1. Register for the same course for credit
    2. Challenge the course by examination

Excessive Course Load

Admitted students are allowed to register for 21 credit hours (including audits) during an academic term without special permission. Fifteen credits are the maximum for summer session. Students wishing to register for an overload must have a 3.0 cumulative GPA and receive special approval from the advisor and the University Registrar. Appeals may be considered for special circumstances. The class schedule will provide associated tuition costs each term.

Non-admitted students are restricted to eight credits per term, with the exception of summer where 15 credit hours are the maximum.

Substitution Within the Curriculum

Students desiring to depart from the curriculum prescribed in the catalog should contact their departmental advisor to begin the process. It is the responsibility of the student to file a petition with the Registrar's Office for such changes. Substitution forms must be approved and filed prior to or with the petition for graduation in order to assure acceptability toward meeting graduation requirements.

Dead Week Policy

Dead Week (the period of Monday morning prior to finals week until the Monday morning of finals week) is the last week of regularly scheduled activities for the term. As such, Dead Week includes routine activities (e.g., lectures, discussions, laboratories, quizzes, assignments, appropriate course reviews, etc.).

1. Final examinations, when utilized, must be given at the scheduled time during finals week
2. No student activities or athletic events will be scheduled during Dead Week
3. Projects and/or examinations due Dead Week may not exceed 20 percent of the final course grade without giving students at least three weeks prior notice

The appropriate vice president must approve any exceptions to this policy.

Final Exams

All teaching faculty will meet their classes during finals week at the final-examination time designated in the official class schedule issued at the beginning of each term.

1. No student activities or athletic events will be scheduled during finals week
2. Methods of evaluation are at the discretion of the instructor. They should be specified in the course syllabus and distributed to students the first week of class
3. Faculty who use a final examination will administer that exam at the time designated in the official class schedule. Finals times are designed not to conflict

Individual students may request exceptions to this policy. These must be approved in advance by the instructor.

Course instructors may request exceptions to this policy. The exception must be approved by the dean of the school and students should be given at least three weeks prior notice of the change.

Graduation

Application for Graduation

Students must file an *Application to Graduate* at least two terms prior to the term of graduation. These forms are available online at www.oit.edu/registrar, at the Registrar's Office, in the Portland-Metro Programs offices and in academic departments. They are submitted to the Registrar's Office for evaluation.

Oregon Tech Portland-Metro students must schedule a graduation degree-check appointment with their major's program director at least two terms prior to graduation. The final graduation check is completed by the Registrar's Office at the Klamath Falls campus.

Sealing of a Degree

All grade changes, removals of incompletes, and transfer work necessary for completion of degree requirements must be on file in the Office of the Registrar by the Friday following the end of the term of graduation. Academic records are sealed ninety days after the conferral of a degree: no changes to the record will be made following that date.

Grade Point Requirement

Oregon Tech requires a minimum cumulative GPA of 2.0 for graduation.

Graduation Residency Requirements

All degrees require students to take a minimum number of Oregon Tech courses. For an associate degree, a minimum of 30 term-credit hours must be taken from Oregon Tech. For a bachelor's, a minimum of 45 term-credit hours must be taken from Oregon Tech. Credits earned through Oregon Tech course challenge or the Oregon Tech Credit-for-Prior-Learning program are considered resident credits toward graduation requirements. All other credits

granted by examination (CLEP or AP) or other methods are non-resident credits. Students desiring to complete course requirements for graduation from Oregon Tech at another college or university must receive prior approval from the Registrar's Office.

Catalog of Graduation

Students must meet all degree requirements from one Oregon Tech catalog. The catalog may be chosen from the year the student is first admitted and enrolled or from any subsequent year. However, at the time of graduation, all students, including transfer students, must use a catalog that is no more than seven years old.

Transfer students may select their catalog of graduation prior to full admission to Oregon Tech by obtaining written approval from their Oregon Tech major department and the University Registrar. The agreed upon catalog will be the one a student uses when he/she transfers to Oregon Tech. Students must enroll at Oregon Tech within two years of this approval.

Departments periodically review their curriculum for technical currency. As a result, significant program changes may occur. Courses previously required in the curriculum can no longer be offered. The major department will provide a transition plan for students to fulfill degree requirements. Programs discontinued by the university may have specific entrance and graduation limits that override the catalog of graduation.

Baccalaureate Upper-Division Credit Requirement

Baccalaureate students must complete a minimum of 60 credits of upper-division work before a degree will be awarded. Upper-division work is defined as 300- and 400-level classes at a bachelor's-degree-granting institution.

Multiple Majors

An undergraduate student may earn multiple majors if all the degree requirements for each major are met. All successfully completed majors will be listed on both the transcript and diploma.

Concurrent Degrees

Students may be granted a second bachelor's degree provided they meet the requirements for both degrees and complete an additional 36 credits beyond the requirements of the first degree. 45 credits are required if the first degree was not granted by Oregon Tech and students must meet the general-education requirements as outlined in their catalog of graduation. If the first bachelor's degree was granted by Oregon Tech, the general education requirements are waived for the second degree.

Curricular Requirements

Curricular requirements are determined by, and vary with, the departments involved. Major requirements are published in this catalog.

Minors

A minor consists of a minimum of 18 credits in a subject field outside the student's major. The total credits required for a minor depend on the academic discipline, the prerequisites of the required courses and the student's starting level in the discipline. Requirements for approved minors are listed by department in this catalog. Minors will only be granted at the time students receive their baccalaureate degrees. Application for a minor must be submitted to the University Registrar with the student's petition to graduate.

Course Substitutions

Students may seek course substitution approval by completing the *Course Substitution form* and obtaining the signature of the advisor, department chair and University Registrar. Course substitutions for general education requirements must satisfy the same category of general education requirement. For example, a humanities course specified by the major department may be substituted for another humanities course, subject to the above approvals.

Graduation in Absentia

Students wishing to complete the Oregon Tech degree by attending another college and transferring work after the minimum residency credits have been met (30 for associate and 45 for bachelor's degree) must complete a *Petition to Graduate* and have the final transferring classes approved for their degree by the transcript evaluator in the Oregon Tech Registrar's Office. This should be done prior to leaving Oregon Tech and beginning at the other college.

Commencement

Oregon Tech's main graduation ceremony is held in Klamath Falls, Oregon in June each year. We encourage earlier graduates of the academic year (Summer, Fall, and Winter), and the graduating candidates for Spring and Summer to participate. Graduates from all Oregon Tech campuses are also invited to participate. Academic honors are calculated for the June ceremony are calculated and based on Winter term grades and honors are estimated. Summer graduates will not receive academic honors at the spring commencement.

Diplomas

Diplomas are not issued at Commencement, regardless of graduation term. You will officially graduate when grades are finalized and it is verified that you have successfully completed all degree requirements. Please allow 4-6 weeks for your degree to be officially awarded to your records and mailed.

NOTE: Diplomas are held if there is an outstanding balance on your student account and/or if required loan Exit Interviews have not been completed.

Academic Honors

At each Commencement, Oregon Tech recognizes academically outstanding students who will receive their bachelor's degree with academic honors. This honor is based on all Oregon Tech courses. *To be eligible for honors a student must complete a minimum of 75 Oregon Tech GPA hours/credits.* Academic honors are based on the following criteria:

Cum Laude
Graduation with honors 3.50-3.74 GPA

Magna Cum Laude
Graduation with high honors 3.75-3.89 GPA

Summa Cum Laude
Graduation with highest honors 3.90-4.00 GPA

NOTE: Students who do not have 75 Oregon Tech credits and who are graduating from a Degree Completion program must complete a minimum of 45 graded Oregon Tech credits to be eligible for honors. For Degree Completion students, who fall into this category, honors are based on all Oregon Tech courses and transfer courses used for the degree.

Honors recognized at the graduation ceremony do not include grades from the term immediately preceding Commencement. After final grades are posted, the honors standing of some students may change. These students will be notified. A student's final honors standing will be posted on the official transcript. Summer graduates will not receive academic honors at the spring commencement.

Only past and spring honors are recognized at commencement, both in the program and with honor cords. Summer graduates will have honors listed on their diploma and official transcripts upon completion.

Academic Term Honors

President's List (Applicable to full-time undergraduate students only)
Each term, students with a GPA of 3.70 or better are included on the President's List.

Dean's List (Applicable to full-time undergraduate students only)
Each term, students with a GPA of 3.30-3.69 are included on the Dean's List.

Honors

Special Recognition
Each spring a number of Oregon Tech graduates will be selected for membership in national honor societies. Honor society members can be identified by a distinctive honor cord worn over the shoulder at Commencement.

Alpha Chi, which selects members from baccalaureate programs, identifies its honor society graduates with a white cord. Tau Alpha Pi, which selects members from the sophomore, junior and senior classes of engineering-technology majors, identifies its graduates with a crimson cord. Lambda Phi Eta selects from juniors and seniors in Communication Studies. Members are identified by a gold cord. Lambda Nu selects from juniors and seniors in Medical Imaging. Members are identified by a cord that is green, gold and maroon. Sigma Theta Tau, who wear gold and maroon cords, includes Nursing students in the top third of the class.

Baccalaureate General Education Requirements

General Education Requirements

Oregon Tech's General Education requirements provide breadth and depth to the Oregon Tech educational experience. The requirements are designed to help students widen perspectives, explore relationships between subjects and develop critical and analytical thinking skills in areas integrated with a student's major. General education provides the core of an undergraduate university education. These courses help students make progress toward becoming educated persons and provide a foundation for lifelong learning.

Through general education at Oregon Tech, students study broad topics, principles, theories and disciplines. The courses are organized within the curriculum in such a manner that students will acquire knowledge, abilities and appreciation as integrated elements of the educational experience. In addition, general education courses teach students to communicate clearly, think critically and globally, define and solve problems within and across disciplines, calculate logically and apply scientific reasoning. No matter what their major, students will benefit from studying areas of knowledge that help them become competent, well-rounded professionals as well as well-educated human beings and citizens.

The General Education Advisory Council and Oregon Tech's faculty review the general education curriculum regularly. Oregon Tech's goal for General Education is to help students become literate, informed, critical participants in a diverse and rapidly changing global society.

All students must complete the university general education requirements as listed in the curriculum map for the major and in this catalog. If a student holds a baccalaureate degree or higher from a recognized, accredited institution, as determined by Oregon Tech, the Oregon Tech general education requirements for the Oregon Tech baccalaureate may be waived subject to departmental program requirements.

Transfer students entering Oregon Tech who have earned either an Associate of Arts Oregon Transfer degree (AAOT) or an Associate of Science in Business degree (ASOTB) from an Oregon community college will be considered as having met Oregon Tech's lower division general education requirements. Please see the Oregon Tech website for updated list of courses granted.

** Remedial or developmental courses, including MATH 100 and WRI 115, cannot be used for graduation.*

Communication

- SPE 111 - Public Speaking
- WRI 121 - English Composition
- WRI 122 - Argumentative Writing
- Plus 9 credits from the following list: COM 205, COM 225, COM 320, COM 347, COM 401, SPE 314, SPE 321, WRI 123, WRI 214, WRI 227, WRI 327, WRI 328, WRI 345, WRI 350, WRI 410

Humanities

9 credits selected by student or specified by a major department from the following:

- ART - Art
- HUM - Humanities
- LIT - Literature
- MUS - Music
- PHIL - Philosophy
- Languages (second year)

Other transfer courses, defined as "humanities" by the Registrar's Office, may be used in this category. No more than three credits of activity or performance-based courses may be used in this category.

Social Science

12 credits selected by student or specified by major department from the following:

- ANTH - Anthropology
- ECO - Economics
- GEOG - Geography
- HIST - History
- PSCI - Political Science
- PSY - Psychology
- SOC - Sociology

Other transfer courses, defined as "social science" by the Registrar's Office, may be used in this category.
* ANTH 101 may not be used to satisfy both Social Science and Science credits
* GEOG 105 may not be used to satisfy Social Science credits

Technology

Specific requirements for demonstrating computer proficiency may be established by the academic department.

Science/Mathematics

One, four credit college-level mathematics course for which at least intermediate algebra is the course prerequisite.
Plus 12 credits selected by student or specified by major department from:

- biological sciences (BIO, CHE, ENV 111)
- mathematics (MATH)
- statistics (STAT 412, STAT 413, STAT 415, or STAT 431)
- physical sciences (PHY)
- physical geography (GEOG 105) or geology (GEOL)
- physical anthropology (ANTH 101)

Other transfer courses, defined as "Science/Mathematics" by the Registrar's Office, may be used in this category. At least four credits must be completed from a laboratory based science course in BIO, CHE, GEOG, GEOL or PHY.

Baccalaureate Upper-Division Requirement

Baccalaureate students must complete a minimum of 60 credits of upper-division work before a degree will be awarded. Upper-division work is defined as 300- and 400-level classes at a bachelor's-degree-granting institution.

Bachelor of Science Degree

The Bachelor of Science degree requires the student to opt between completion of 36 credits in mathematics and science or 45 credits in mathematics, science and social science. Students placed at a higher beginning level of mathematics than is published in the curriculum of their major may choose to substitute those mathematics credits surpassed by their accelerated level of placement with electives from any department to attain the required number of general education credits required by the university for graduation.

Intercultural Studies

Students are encouraged to select at least one class from the following lists of intercultural courses. These courses also satisfy general education requirements:

Humanities:

COM 205 - Intercultural Comm
LIT 266 - Native American Lit & Film
LIT 235 - American Multicultural Lit
LIT 381 - Contemporary World Lit
HUM 147 - West Cult in the Classical Age
HUM 148 - West Cult in the Medieval Age
HUM 149 - West Cult in the Modern Age

Social Science:

ANTH 103 - Intro to Cultural Anthropology
GEOG 106 - Cultural Geography I
GEOG 107 - Cultural Geography II
GEOG 108 - Cultural Geography III
HIST 392 - Modern Asia

University Departments and Programs

Oregon Institute of Technology

Health, Arts and Sciences

Applied Mathematics Department

Tiernan Fogarty, *Department Chair*
Randall Paul, *Scheduling Coordinator*
Cristina Negoita, *Program Director, Applied Mathematics*
Rosanna Overholser, *Program Director, Data Science*
Dibyajyoti Deb, *Curriculum Coordinator*
Professors: J. Fischer, T. Fogarty, C. Negoita, R. Paul, T. Torres
Associate Professors: D. Deb, D. Hammond, J. Reid
Assistant Professors: K. Davis, P. Overholser, R. Overholser

General Education

Courses offered by the Department of Applied Mathematics are designed to satisfy the needs of majors and non-majors interested in mathematics primarily as part of a broad technical education. A major emphasis is on development of skills required to solve applied problems.

Success in mathematics requires that entering students begin their study in the course which best matches their ability and background. Accordingly, all entering students must pass a placement examination at the appropriate level before being allowed to register for their initial mathematics course.

Degrees Offered

- Bachelor of Science in Applied Mathematics
- Bachelor of Science in Data Science

Minors Offered

- Applied Mathematics
- Applied Statistics

Applied Mathematics

Program Objectives

Coursework for the bachelor's degree is intended to provide a solid foundation of mathematical theory and a broad selection of applied work both in and outside mathematics. The prospective major will complete coursework in calculus, differential equations and numerical methods. Students also take a sequence of introductory physics courses and a further sequence in a technical field outside mathematics.

Career Opportunities

Upon completing the requirements for the Applied Mathematics degree students will be prepared for a variety of jobs in industry including numerical modeling, signal processing, data analysis, and many others. The degree also provides students a sufficient background to further their education by entering a Masters or Ph.D. program in Mathematics or Applied Mathematics.

Student Preparation

Students entering the Applied Mathematics Program from high school should have a minimum of two years of algebra, one year of pre-calculus, one year of geometry, and two years of physical science (physics or chemistry preferred). Additional courses in mathematics, science, English and computer programming will be very helpful. Students entering the Applied Mathematics Program by transfer are requested to contact the Mathematics Department concerning transfer of technical course work.

Data Science

Data scientists use computation and applied mathematics to extract insights from data. In addition to technical duties, they work as part of a team, must communicate effectively, and account for ethical and context-specific considerations. The B.S. in Data Science degree at Oregon Tech prepares students for these roles by combining coursework from five departments: Applied Mathematics (the program host), Computer Systems Engineering Technology, Communication, Management and Geomatics.

A key element of the program is extensive hands-on experience. In their junior year, students work in small teams to design or implement applications of material from previous classes. In their senior year, each student completes a capstone project to develop a data driven solution for an outside group, such as a local business or national organization.

The mathematical and programming skills gained in the program enable students to go beyond off-the-shelf solutions for machine learning and data processing. Students are introduced to advanced methods for large and/or complex data, such as time-series, geospatial or text. A special emphasis is placed on using transparent statistical methods, in which assumptions for mathematical models can be clearly communicated to and understood by a non-technical audience who are then better equipped to rate the value of conclusions draw from such models.

After graduation, students are ready for immediate employment as data scientists or for advanced coursework.

Program Objectives

Graduates will have the technical skills necessary to gain actionable insights from data, the ability to effectively communicate these insights as a member of an interdisciplinary team, and the necessary foundation in ethics, mathematics, and computer science to thrive in the evolving field of data science. Graduates will

1. be prepared for the professional practice of data science or acceptance into a graduate program,
2. have an appropriate foundation in mathematics, statistics, and computer science in order to thrive in an evolving field,
3. be able to identify and incorporate ethical considerations in their work,
4. be able to identify, collect and analyze the data necessary for actionable insights, and
5. be able to effectively communicate findings.

Career Opportunities

Data scientists work in a wide variety of contexts. For example, a data scientist might help design a survey to inform the marketing strategy for a new product, analyze data from electronic health records or gather large amounts of data from websites or government databases.
Graduates may obtain employment under a variety of job titles, which may include data scientist, data analyst, business intelligence analyst, research analyst, and statistician.

Many people currently working as data scientists hold advanced degrees but this trend may change as undergraduate programs begin to produce graduates with appropriate skill sets.

Student Preparation and Admissions

Students must meet the standard Oregon Tech admissions requirements. Transfer students must arrange for official transcripts from each college and university attended to be sent to Oregon Tech and are requested to contact the Applied Mathematics Department concerning transfer of technical course work.

Program Curriculum

Students looking to work within a specific context or apply for a specific graduate program should work closely with their advisor to choose a relevant application for their senior year project and to pursue an appropriate minor or other additional coursework.

Applied Mathematics, BS

Degree Requirements

In addition to the mathematics requirements listed below, students will be required to complete the 200 level calculus-based general physics sequence as well as other general education requirements and Electives necessary to bring the total credit hours to 182. Please see the recommended curriculum map below. All mathematics courses must be completed with a grade "C" or better. Transfer students should consult the Admissions Office and the Mathematics Department to determine which of their courses will satisfy Oregon Tech course requirements.

Lower-Division Required Courses (18 credits)
MATH 221 - Intro to Computational Sftware Credit Hours: 2
MATH 251 - Differential Calculus Credit Hours: 4
MATH 252 - Integral Calculus Credit Hours: 4
MATH 253 - Sequences and Series Credit Hours: 4
MATH 254 - Vector Calculus I Credit Hours: 4

Upper-Division Core Requirements (44 credits)
MATH 310 - Mathematical Structures Credit Hours: 4
MATH 311 - Introduction to Real Analysis Credit Hours: 4
MATH 321 - Appl Diff Equation I Credit Hours: 4
MATH 322 - Appl Diff Equation II Credit Hours: 4
MATH 341 - Linear Algebra I Credit Hours: 4
MATH 354 - Vector Calculus II Credit Hours: 4
MATH 361 - Statistical Methods I Credit Hours: 4
MATH 421 - Applied Partial Diff Equations Credit Hours: 4
MATH 451 - Numerical Methods I Credit Hours: 4

Plus two additional courses chosen from:
MATH 422 - Applied Partial Diff Equtns II Credit Hours: 4
MATH 423 - Applied Partial Diff Equ III Credit Hours: 4
MATH 452 - Numerical Methods II Credit Hours: 4
MATH 453 - Numerical Methods III Credit Hours: 4

Upper-Division Math/Physics Electives (At least 7 credits)
Students will choose 2 upper-level mathematics or physics courses with the approval of a mathematics advisor. No more than 3 credits can be MATH 407.

Focused Electives (16 credits)
Students will choose appropriate electives from outside of mathematics. These courses should support the program objectives and must be approved by a mathematics advisor. The focused electives must total at least 16 credits at least 9 of which are from a 3 course sequence; see below for examples.

Examples of Focused Electives Sequences
CST 116, CST 126, CST 223 Programming Languages
CHE 221, CHE 222, CHE 223 General Chemistry
ENGR 211, ENGR 212, ENGR 213 Engineering Mechanics: Statics, Dynamics, Strength of Materials
PHY 311, PHY 312, PHY 313 Introduction to Modern Physics

Examples of Focused Electives
CHE 331, CHE 332, CHE 333 Organic Chemistry
ENGR 318 - Engineering Mech: Fluids
ENGR 236 - Fund of Elec Circuits
PSY 361 - Industrial Psychology
MIT 341 - Magnetic Resonance Imaging

Notes:
1. Some of the above courses have an additional lab requirement.
2. PHY 221, PHY 222, PHY 223 may not be used as focused electives.

Curriculum

Required courses and recommended terms during which they should be taken:

Freshman Year Fall
MATH 251 - Differential Calculus Credit Hours: 4
SPE 111 - Public Speaking Credit Hours: 3
WRI 121 - English Composition Credit Hours: 3
Social Science Elective Credit Hours: 3
Elective Credit Hours: 3
Total: 16 Credit Hours

Winter
CST 116 - C++ Programming I Credit Hours: 4
or
ENGR 266 - Engineering Computation Credit Hours: 3
or
ENGR 267 - Engineering Programming Credit Hours: 3

MATH 252 - Integral Calculus Credit Hours: 4
PHY 221 - General Physics w/Calculus Credit Hours: 4
WRI 122 - Argumentative Writing Credit Hours: 3
Social Science Elective Credit Hours: 3
Total: 17/18 Credit Hours

Spring
MATH 253 - Sequences and Series Credit Hours: 4
PHY 222 - General Physics w/Calculus Credit Hours: 4
Humanities Elective Credit Hours: 3
Social Science Elective Credit Hours: 3
Total: 14 Credit Hours

Sophomore Year Fall
MATH 254 - Vector Calculus I Credit Hours: 4
MATH 321 - Appl Diff Equation I Credit Hours: 4
PHY 223 - General Physics w/Calculus Credit Hours: 4
Elective Credit Hours: 3
Total: 15 Credit Hours

Winter
MATH 341 - Linear Algebra I Credit Hours: 4
MATH 354 - Vector Calculus II Credit Hours: 4
Elective Credit Hours: 4
Humanities Elective Credit Hours: 3
Total: 15 Credit Hours

Spring
MATH 361 - Statistical Methods I Credit Hours: 4
Elective Credit Hours: 3
Elective Credit Hours: 3
Elective Credit Hours: 3
Humanities Elective Credit Hours: 3
Total: 16 Credit Hours

Junior Year Fall
MATH 310 - Mathematical Structures Credit Hours: 4
SPE 321 - Small Group/Team Comm Credit Hours: 3
Focused Elective Credit Hours: 3 [a]
Elective Credit Hours: 4 (upper division)
Total: 14 Credit Hours

Winter
MATH 311 - Introduction to Real Analysis Credit Hours: 4
WRI 227 - Technical Report Writing Credit Hours: 3
Focused Elective Credit Hours: 3 [a]
Elective Credit Hours: 3 (upper division)
Elective Credit Hours: 3
Total: 16 Credit Hours

Spring
MATH 322 - Appl Diff Equation II Credit Hours: 4
MATH 451 - Numerical Methods I Credit Hours: 4
Focused Elective Credit Hours: 3 [a]
Math/Physics Elective Credit Hours: 3 [b]
Elective Credit Hours: 2
Total: 16 Credit Hours

Senior Year Fall
MATH 421 - Applied Partial Diff Equations Credit Hours: 4
Focused Elective Credit Hours: 4 [a]
Math/Physics Elective Credit Hours: 4 [b]
Elective Credit Hours: 3
Total: 15 Credit Hours

Winter
Mathematics Core Credit Hours: 4 (upper-division) [c]
Focused Elective Credit Hours: 3 [a]
Social Science Elective Credit Hours: 3
Elective Credit Hours: 3
Elective Credit Hours: 3
Total: 16 Credit Hours

Spring
Mathematics Core Credit Hours: 4 (upper-division) [c]

WRI 327 - Advanced Tech Writing Credit Hours: 3
or
WRI 350 - Documentation Develop Credit Hours: 3

Elective Credit Hours: 3
Elective Credit Hours: 3
Total: 13 Credit Hours

Total for a B.S. in Mathematics: 183-184 Credit Hours

[a] Students will choose at least 16 credits from outside of mathematics with the approval of a mathematics advisor. At least 9 credits should be from a 3 course sequence. See above for examples.
[b] Students will choose 2 upper-division courses from mathematics or physics with the approval of a mathematics advisor.
[c] See "Upper-Division Core Requirements" listed above in the degree requirements section. The years and terms that these courses are offered will vary. For questions about availability, please consult with an advisor or contact the Mathematics Department.

Data Science, BS

Curriculum

Required courses and recommended terms during which they should be taken:

Freshman Year Fall
Stat 201 - Intro to Data Science Credit Hours: 4
WRI 121 - English Composition Credit Hours: 3
Humanities Elective Credit Hours: 3
Social Science Elective Credit Hours: 3
Total: 13 Credit Hours

Winter
CST 116 - C++ Programming I Credit Hours: 4
GIS 134 - Geographic Info Systems Credit Hours: 3
WRI 122 - Argumentative Writing Credit Hours: 3
Humanities Elective Credit Hours: 3
Social Science Elective Credit Hours: 3
Total: 16 Credit Hours

Spring
CST 126 - C++ Programming II Credit Hours: 4
MATH 251 - Differential Calculus Credit Hours: 4
SPE 111 - Public Speaking Credit Hours: 3
Social Science Elective Credit Hours: 3
Total: 14 Credit Hours

Sophomore Year Fall
CST 136 - OOP with C++ Credit Hours: 4
MATH 252 - Integral Calculus Credit Hours: 4
WRI 227 - Technical Report Writing Credit Hours: 3
Lab Science Elective Credit Hours: 4
Total: 15 Credit Hours

Winter
MATH 254 - Vector Calculus I Credit Hours: 4
MATH 361 - Statistical Methods I Credit Hours: 4
MIS 275 - Intro to Relational Databases Credit Hours: 4
Lab Science Elective Credit Hours: 4
Total: 16 Credit Hours

Spring
CST 211 - Data Structures Credit Hours: 4
SPE 321 - Small Group/Team Comm Credit Hours: 3
STAT 211 - Data Science Methods: Credit Hours: 4
Social Science Elective Credit Hours: 3
Total: 14 Credit Hours

Junior Year Fall
MATH 341 - Linear Algebra I Credit Hours: 4
MATH 362 - Statistical Methods II Credit Hours: 4
MATH 465 - Mathematical Statistics Credit Hours: 4
STAT 395 - Junior Project I Credit Hours: 4
Total: 16 Credit Hours

Winter
GIS 316 - Geospatial Vector Analysis I Credit Hours: 4
MATH 451 - Numerical Methods I Credit Hours: 4
STAT 396 - Junior Project II Credit Hours: 4
STAT 441 - Statistical Machine Learning I Credit Hours: 4
Total: 16 Credit Hours

Spring
MATH 342 - Linear Algebra II Credit Hours: 4
MIS 311 - Intro to Systems Analysis Credit Hours: 3
STAT 397 - Junior Project III Credit Hours: 1
STAT 412 - Regression & Times Series Credit Hours: 4
STAT 442 - Statistical Machine Learning II Credit Hours: 4
Total: 16 Credit Hours

Senior Year Fall
CST 324 - Database Systems and Design Credit Hours: 4
GIS 306 - Geospatial Raster Analysis Credit Hours: 4
MIS 312 - Systems Analysis I Credit Hours: 4
STAT 495 - Senior Project I Credit Hours: 4
Total: 16 Credit Hours

Winter
GIS 332 - Customizing the GIS Environ I Credit Hours: 4
MATH 327 - Discrete Mathematics Credit Hours: 4
MIS 334 - Business Analytics Credit Hours: 4

PHIL 331 - Ethics in the Professions Credit Hours: 3
or
PHIL 342 - Business Ethics Credit Hours: 3

STAT 496 - Senior Project II Credit Hours: 2
Total: 17 Credit Hours

Spring
CST 475 - Big-Data Analysis Credit Hours: 3
STAT 405 - Advanced Methods in Data Science Credit Hours: 4
STAT 467 - Spatial Statistics Credit Hours: 4
STAT 497 - Senior Project III Credit Hours: 2

WRI 327 - Advanced Tech Writing Credit Hours: 3
or
WRI 345 - Science Writing Credit Hours: 3
or
WRI 350 - Documentation Develop Credit Hours: 3
Total: 16 Credit Hours

Total for a B.S. in Data Science 185 Credit Hours

Applied Mathematics Minor

The minor in Applied Mathematics provides formal recognition of mathematical proficiency. It is composed of a core of required courses and upper-division electives related to the student's major. The minor consists of 29 credits, 19 from required courses and 10 from elective courses.

This minor is open to all majors and is especially recommended for students with an interest in pursuing a career related to mathematics. It will enhance their employability and improve graduate school possibilities.

Curriculum

A passing grade in all courses and a cumulative GPA of 2.0 or better is required to be awarded the minor. At least 12 credits must be taken at Oregon Tech.

Required Courses:
MATH 251 - Differential Calculus Credit Hours: 4
MATH 252 - Integral Calculus Credit Hours: 4
MATH 253 - Sequences and Series Credit Hours: 4
MATH 254 - Vector Calculus I Credit Hours: 4
MATH 341 - Linear Algebra I Credit Hours: 4
Plus 10 additional upper-division mathematics credits selected from the list below.

Upper-Division Electives:
Students are required to consult an advisor from the Mathematics Department to select upper-division mathematics courses that would be most applicable to their major and/or career goals.
MATH 311 - Introduction to Real Analysis Credit Hours: 4
MATH 321 - Appl Diff Equation I Credit Hours: 4
MATH 322 - Appl Diff Equation II Credit Hours: 4
MATH 327 - Discrete Mathematics Credit Hours: 4
MATH 342 - Linear Algebra II Credit Hours: 4
MATH 346 - Number Theory Credit Hours: 4
MATH 347 - Fundmtls of Abstract Algebra Credit Hours: 4
MATH 354 - Vector Calculus II Credit Hours: 4
MATH 362 - Statistical Methods II Credit Hours: 4
MATH 421 - Applied Partial Diff Equations Credit Hours: 4
MATH 422 - Applied Partial Diff Equtns II Credit Hours: 4
MATH 423 - Applied Partial Diff Equ III Credit Hours: 4
MATH 451 - Numerical Methods I Credit Hours: 4
MATH 452 - Numerical Methods II Credit Hours: 4
MATH 453 - Numerical Methods III Credit Hours: 4
MATH 465 - Mathematical Statistics Credit Hours: 4
Note: Not all courses are offered every term or every year

Applied Statistics Minor

The Minor in Applied Statistics is open to students in all majors and is specifically recommended for those students who wish to pursue graduate school or work in research. Students pursuing the minor will have enhanced statistical skills and a deeper understanding of statistics than what is received in one or two introductory courses. A minimum of 18 credits is required to complete this minor, 8 credits from required courses and 10 credits from elective courses.

Curriculum List

Students are advised to consult an advisor from the Mathematics Department of select upper-division mathematics courses that would be most applicable to their major and/or career goals.

1. A minimum of 18 credits (all earned with grade of "C" or above) is required to earn the minor.
2. Required courses: MATH 361 - Statistical Methods I and MATH 362 - Statistical Methods II. In addition, at least 10 more credits of upper–division courses are needed from the lists below. Note that at least 4 credits of those must come from MATH/STAT courses listed below.
3. At least 12 credits must be taken at OIT.

Courses

Upper-Division MATH/STAT Electives (at **least** 4 credits)
MATH 465 - Mathematical Statistics Credit Hours: 4
STAT 413 - Categorical Data Analysis Credit Hours: 4
STAT 431 - Sampling Methods Credit Hours: 4
STAT 412 - Regression & Times Series Credit Hours: 4
STAT 415 - Dsgn & Analysis of Experiments Credit Hours: 4
STAT 414 - Stat Methods in Epidemiology Credit Hours: 4

Additional Courses
(at most **6 credits)**
ENV 434 - Advanced Data Analysis Credit Hours: 4

BUS 456 - Business Research Methods Credit Hours: 3
or
BUS 457 - Business Research Methods II Credit Hours: 3

COM 326 - Communication Research Credit Hours: 3
GME 444 - Adjustment by Least Squares Credit Hours: 4
MFG 333 - Stat Methods Qual/Improv Credit Hours: 3

MGT 461 - Lean/Six Sigma Management I Credit Hours: 3
or
MGT 462 - Lean/Six Sigma Management II Credit Hours: 3
or
MGT 463 - Lean/Six Sigma Management III Credit Hours: 3

PSY 313 - Psych Research Methods I Credit Hours: 4
or
PSY 314 - Psych Research Methods II Credit Hours: 4

Note: **Not all courses are offered every term or every year.**

Communication Department

Veronica Koehn, *Department Chair*
Professors: K. Brown, M. Schnackenberg
Associate Professors: A. Fultz, F. Howes, K. Lundgren, V. Koehn, M. Search, C. Syrnyk
Assistant Professors: C. Akers, M. Frye, A. Lancaster, R. Schwartz
Instructor: A. McCracken

Degrees Offered

- Bachelor of Science in Communication Studies
- Bachelor of Science in Professional Writing

Minors Offered

- Human Interaction
- Professional Writing and Technical Communication

Certificate Offered

- Dispute Resolution

The Bachelor of Science in Communication Studies allow students flexibility in designing a program that fits their life and career goals. Students choose core courses and electives from areas such as technical, organizational, and interpersonal communication. In addition, students build a career foundation by completing a *focused sequence of Electives*.

Career Opportunities

The Communication Studies Program prepares students for careers in areas such as technical communication, organizational communication, new communication technologies, education, human resources, project management, public relations, sales, and mediation.

General Education Courses

To ensure that Oregon Tech's graduates are skilled communicators, the Communication Department provides writing, speech, and communication courses to satisfy general education requirements. Students in other majors should consult the general education and degree requirements in their major departments.

Student Preparation

All students who plan to study at Oregon Tech should enroll in writing and speech classes during their high school years to better benefit from the university's communication courses. Students applying to the Communication Studies Program should have especially strong reading and writing skills. It is important to have a well-rounded college preparation background, including courses in math, sciences, and general education.

Communication Studies, BS

Degree Requirements

The Bachelor of Science in Communication Studies requires 184 credits. All major courses, general education communication courses, and focused sequence of electives courses must be completed with a grade of "C" or higher.

Curriculum

Required courses and recommended terms during which they should be taken:

Freshman Year Fall
COM 104 - Introduction to Communication Credit Hours: 3
COM 115 - Intro to Mass Communication Credit Hours: 3
COM 225 - Interpers Communication Credit Hours: 3
COM 135 - Communication Software Credit Hours: 3 [a]
WRI 121 - English Composition Credit Hours: 3
Total: 15 Credit Hours

Winter
COM 105 - Intro to Communication Theory Credit Hours: 3
PSY 201 Psychology Credit Hours: 3
SPE 111 - Public Speaking Credit Hours: 3
WRI 122 - Argumentative Writing Credit Hours: 3
Social Science Elective Credit Hours: 3
Total: 15 Credit Hours

Spring
ART 215 - Design Arts and Aesthetics Credit Hours: 3
COM 106 - Introduction to Comm Research Credit Hours: 3
COM 109 - Intro to Communication Tech Credit Hours: 3
COM 205 - Intercultural Comm Credit Hours: 3
Social Science Elective Credit Hours: 3
Total: 15 Credit Hours

Sophomore Year Fall
COM 216 - Essen of Grammar & Punctuation Credit Hours: 3
COM 326 - Communication Research Credit Hours: 3
SPE 321 - Small Group/Team Comm Credit Hours: 3
WRI 227 - Technical Report Writing Credit Hours: 3
MATH - Any for which MATH 100 pre-req Credit Hours: 4
Total: 16 Credit Hours

Winter
COM 237 - Intro to Visual Communication Credit Hours: 3
COM 248 - Digital Media Production Credit Hours: 3
JOUR 211 - Pub/Student Newspaper Credit Hours: 3
Focused Sequence Elective Credit Hours: 3
Open Elective Credit Hours: 3
Total: 15 Credit Hours

Spring
COM 255 - Communication Ethics Credit Hours: 3
COM 276 - Democracy and Media Credit Hours: 3
Business Elective Credit Hours: 3
Focused Sequence Elective Credit Hours: 3
Laboratory Science/Math Elective Credit Hours: 4
Total: 16 Credit Hours

Junior Year Fall
COM 301 - Rhetorical Theory & Applicatn Credit Hours: 3
or
COM 305 - Contemporary Rhetorical Theory Credit Hours: 3

COM 325 - Gender and Communication Credit Hours: 3
COM 326 - Communication Research Credit Hours: 3
Focused Sequence Elective Credit Hours: 3
Open Elective Upper Division Credit Hours: 3
Total: 15 Credit Hours

Winter
COM 345 - Organization Comm I Credit Hours: 3
SPE 314 - Argumentation Credit Hours: 3
Open Elective Upper Division Credit Hours: 3
Focused Sequence Upper Division Elective Credit Hours: 3
Focused Sequence Elective Credit Hours: 3
Total: 15 Credit Hours

Spring
COM 347 - Negotiation & Conflict Resol'n Credit Hours: 3
COM 358 - Communication and the Law Credit Hours: 3
Focused Sequence Elective Credit Hours: 3
Humanities Elective Credit Hours: 3
Writing Elective Upper Division Credit Hours: 3
Total: 15 Credit Hours

Senior Year Fall
COM 309 - Communication Tech in Use Credit Hours: 3
Humanities Elective Upper Division Credit Hours: 3
Open Elective Credit Hours: 3
Social Science Upper Division Elective Credit Hours: 3
COM 420 - Externship Credit Hours: minimum 4
Total: 16 Credit Hours

Winter
COM 420 - Externship Credit Hours: minimum 4
Focused Sequence Elective Credit Hours: 3
Open Elective Upper Division Credit Hours: 3
Social Science Elective Credit Hours: 3
Total: 13 Credit Hours

Spring
COM 424 - Capstone Course Credit Hours: 3
Focused Sequence Elective Credit Hours: 3
Laboratory Science/Math Elective Credit Hours: 4
COM 420 - Externship Credit Hours: minimum 4
Total: 14 Credit Hours

Total for a B.S. in Communication Studies: 184 Credit Hours

Notes:

1. There is no guarantee of externships for Communication Studies majors.
2. The best externship experiences are often those identified and arranged by students.

Professional Writing, BS

Curriculum

Required courses and recommended terms during which they should be taken:

Freshman Year Fall
COM 115 - Intro to Mass Communication Credit Hours: 3
COM 135 - Communication Software Credit Hours: 3

MATH 111 - College Algebra Credit Hours: 4
or
MATH 243 - Introductory Statistics Credit Hours: 4

PWR 101 - Intro to Professional Writing Credit Hours: 3
WRI 121 - English Composition Credit Hours: 3
Total: 16 Credit Hours

Winter
JOUR 211 - Pub/Student Newspaper Credit Hours: 3
WRI 122 - Argumentative Writing Credit Hours: 3
Humanities Elective Credit Hours: 3
PWR Elective Credit Hours: 3
Social Science Elective Credit Hours: 3
Total: 15 Credit Hours

Spring
ART 215 - Design Arts and Aesthetics Credit Hours: 3
or
ART 226 - Digital Photography Credit Hours: 3

COM 109 - Intro to Communication Tech Credit Hours: 3
PWR 102 - Introduction to Web Authoring Credit Hours: 3
SPE 111 - Public Speaking Credit Hours: 3
Technical Elective Credit Hours: 3 or 4
Total: 15 Credit Hours

Sophomore Year Fall
COM 216 - Essen of Grammar & Punctuation Credit Hours: 3

COM 256 - Public Relations Credit Hours: 3
or
PWR 215 - Writing in the Public Interest Credit Hours: 3

WRI 227 - Technical Report Writing Credit Hours: 3
Technical Elective Credit Hours: 3
Emphasis Elective Credit Hours: 3
Total: 15 Credit Hours

Winter
COM 237 - Intro to Visual Communication Credit Hours: 3
COM 248 - Digital Media Production Credit Hours: 3
PWR 330 - User Research Credit Hours: 3
Humanities Elective Credit Hours: 3
Emphasis Elective Credit Hours: 3
Total: 15 Credit Hours

Spring
COM 225 - Interpers Communication Credit Hours: 3
COM 255 - Communication Ethics Credit Hours: 3
WRI 328 - Style Credit Hours: 3
Lab Science Elective Credit Hours: 4
Technical Elective Credit Hours: 3
Total: 16 Credit Hours

Junior Year Fall
COM 301 - Rhetorical Theory & Applicatn Credit Hours: 3
or
COM 305 - Contemporary Rhetorical Theory Credit Hours: 3

SPE 321 - Small Group/Team Comm Credit Hours: 3
WRI 420 - Document Design Credit Hours: 3
Lab Science Elective Credit Hours: 4
Social Science Elective Credit Hours: 3
Total: 16 Credit Hours

Winter
PWR 355 - Project Mgmt for Writers Credit Hours: 3
SPE 314 - Argumentation Credit Hours: 3
WRI 415 - Technical Editing Credit Hours: 3
Social Science Elective Credit Hours: 3
Technical Elective Credit Hours: 3
Total: 15 Credit Hours

Spring
COM 358 - Communication and the Law Credit Hours: 3
WRI 410 - Grant and Proposal Writing Credit Hours: 3
WRI 425 - Advanced Composition Credit Hours: 3
Emphasis Elective Credit Hours: 3
Technical Elective Credit Hours: 3
Total: 15 Credit Hours

Senior Year Fall
COM 345 - Organizational Communication Credit Hours: 3
PWR 490 - Portfolio Development Credit Hours: 3
PWR 499 - Internship in Pro Writing Credit Hours: 3
Emphasis Elective Credit Hours: 3
Science Elective Credit Hours: 4
Total: 16 Credit Hours

Winter
PWR 499 - Internship in Pro Writing Credit Hours: 3
COM/WRI Upper Division Elective Credit Hours: 3
Emphasis Elective Credit Hours: 3
PWR Elective Credit Hours: 3
Technical Elective Credit Hours: 3
Total: 15 Credit Hours

Spring
COM 424 - Capstone Course Credit Hours: 3
PWR 499 - Internship in Pro Writing Credit Hours: 3
Emphasis Elective Upper Division Credit Hours: 3
Social Science Elective Credit Hours: 3
Technical Elective Upper Division Credit Hours: 3
Total: 15 Credit Hours

Total for a B.S. in Professional Writing: 184 Credit Hours

Notes:
[a] MIS 101, MIS 102, and MIS 103 may be substituted for COM 135

Emphasis Courses (18 Credits Minimum)

Students will select from one of the following Emphasis areas in order to satisfy the emphasis elective and technical elective requirements.

Digital Media Emphasis

(beyond the required courses in the program)
COM 115 - Intro to Mass Communication Credit Hours: 3
COM 207 - Seminar Credit Hours: 6 International Media Seminar: Paris
COM 215 - Creativity in Comm Credit Hours: 3
COM 248 - Digital Media Production Credit Hours: 3
COM 309 - Communication Tech in Use Credit Hours: 3
COM 365 - Electronic Comm & Society Credit Hours: 3
COM 415 - Dev Eff Multmdia Presntn Credit Hours: 3
HUM 335 - Video Game Studies Credit Hours: 3
HUM 345 - Digital Culture and Society Credit Hours: 3
PHIL 205 - Introduction to Logic Credit Hours: 3
PWR 206 - Social Media Credit Hours: 3
PWR 220 - Writing for Interactive Media Credit Hours: 3
PWR 315 - Advanced Web Authoring Credit Hours: 3
WRI 225 - Writing Nonfiction Credit Hours: 3
WRI 305 - Writ for the Marketplace Credit Hours: 3

Scientific and Technical Emphasis

(beyond the required courses in the program)
BIO 200 - Medical Terminology Credit Hours: 2
BIO 209 - Current Research Tpc Med Sci I Credit Hours: 1
COM 347 - Negotiation & Conflict Resol'n Credit Hours: 3
PHIL 205 - Introduction to Logic Credit Hours: 3
PHIL 305 - Medical Ethics Credit Hours: 3
PHIL 331 - Ethics in the Professions Credit Hours: 3
PWR 306 - Writing for the Health Professions Credit Hours: 3
PWR 315 - Advanced Web Authoring Credit Hours: 3
PWR 320 - Structured Authoring Credit Hours: 3
WRI 225 - Writing Nonfiction Credit Hours: 3
WRI 327 - Advanced Tech Writing Credit Hours: 3
WRI 345 - Science Writing Credit Hours: 3
WRI 350 - Documentation Develop Credit Hours: 3

Writing in Organizations Emphasis

(beyond the required courses in the program)
BUS 313 - Health Care Systems & Policy Credit Hours: 3
COM 347 - Negotiation & Conflict Resol'n Credit Hours: 3
COM 437 - Comm Training & Devpmt Credit Hours: 3
COM 445 - Organiz'l Communication II Credit Hours: 3
COM 446 - Communication & Leadership Credit Hours: 3
PHIL 331 - Ethics in the Professions Credit Hours: 3
PSY 347 - Organizational Behavior Credit Hours: 3
PWR 206 - Social Media Credit Hours: 3
PWR 215 - Writing in the Public Interest Credit Hours: 3
PWR 306 - Writing for the Health Professions Credit Hours: 3
PWR 310 - Professional Writing for International Audiences Credit Hours: 3
PWR 315 - Advanced Web Authoring Credit Hours: 3
PWR 320 - Structured Authoring Credit Hours: 3
WRI 216 - Public Relations Writing Credit Hours: 3
WRI 327 - Advanced Tech Writing Credit Hours: 3

Dispute Resolution Certificate

The Dispute Resolution Certificate provides students with a thorough foundation of communication courses related to dispute resolution. The program culminates in specialized courses: negotiation, facilitation, and mediation, giving students expertise in the field. A practicum in mediation offers practical experience in community mediation and guarantees competence of students completing the certificate. This certificate provides students with both the theoretical background and the practical experience to effectively resolve conflicts in a variety of contexts.

Prerequisite or Corequisite Classes

SPE 111 - Public Speaking Credit Hours: 3
WRI 121 - English Composition Credit Hours: 3
WRI 122 - Argumentative Writing Credit Hours: 3

Program Courses

COM 205 - Intercultural Comm Credit Hours: 3
COM 225 - Interpers Communication Credit Hours: 3
COM 226 - Nonverbal Communication Credit Hours: 3
COM 345 - Organization Comm I Credit Hours: 3
COM 347 - Negotiation & Conflict Resol'n Credit Hours: 3
COM 348 - Facilitation Credit Hours: 3
COM 425 - Mediation Credit Hours: 3
COM 426 - Mediation Practicum Credit Hours: 3
SPE 321 - Small Group/Team Comm Credit Hours: 3

Human Interaction Minor

The Human Interaction Minor supplements Oregon Tech technical and applied science degrees and provides advanced training in interaction skills. The minor offers courses in the analysis and practice of human interaction in a variety of contexts. The minor focuses on helping students to gain competency in building relationships, dealing with difference and managing conflict. Students who have performed well in general education communication courses are encouraged to enroll in this minor. For further information on enrollment, contact the Communication Department curriculum coordinator.

Career Opportunities

The Human Interaction minor enhances students' employability and career flexibility. Employers in many industries seek employees who demonstrate competent interaction on multi-disciplinary teams, communicate in many (including international) contexts, understand and resolve conflict in the workplace and create effective communication in diverse settings.

Requirements of Minor

SPE 321 - Small Group/Team Comm Credit Hours: 3
COM 205 - Intercultural Comm Credit Hours: 3
COM 225 - Interpers Communication Credit Hours: 3

In addition, students will select THREE from the following list of courses:

COM 336 - Nonverbal Communication Credit Hours: 3
COM 325 - Gender and Communication Credit Hours: 3
COM 345 - Organization Comm I Credit Hours: 3
COM 346 - Health Communication Credit Hours: 3
COM 347 - Negotiation & Conflict Resol'n Credit Hours: 3
COM 446 - Communication & Leadership Credit Hours: 3

Professional Writing and Technical Communication Minor

The Professional Writing and Technical Communication Minor supplements Oregon Tech technical degrees and provides advanced training and experience in communication skills. The minor offers specialized communication courses in such varied areas as proposal and grant writing, documentation development, and technical editing.

Students who have performed above-average work in their lower-division communication courses are encouraged to enroll in the program. For further information on enrollment, contact any Communication Department faculty member.

Career Opportunities

The Professional Writing and Technical Communication Minor will enhance students' flexibility as their careers develop. Employers in private industry, governmental agencies, and research facilities seek a unique combination of skills. First, employers know that the major coursework at Oregon Tech prepares students well. Second, the Professional Writing and Technical Communication Minor courses build skills in project development, manual writing and editing, computer-aided writing and publishing, oral presentations, and interviewing skills that complement technical education. Even if students choose not to work as technical writers or editors, the Professional Writing and Technical Communication Minor may increase job opportunities and professional advancement.

Requirements of the Minor

Students take one required core course, an upper-division WRI course from an approved list, and four electives from the list below. Students must earn a "C" or better in all courses to complete the minor.

Required Courses

Students take WRI 227 and one core option from the list below.
WRI 227 - Technical Report Writing Credit Hours: 3
and

WRI 327 - Advanced Tech Writing Credit Hours: 3
or
WRI 328 - Style Credit Hours: 3
or
WRI 345 - Science Writing Credit Hours: 3
or
WRI 350 - Documentation Develop Credit Hours: 3
or
WRI 410 - Proposal & Grant Writing Credit Hours: 3

Elective Courses
Students take four elective from the following list. At least two should be upper division.
COM 301 - Rhetorical Theory & Applicatn Credit Hours: 3
COM 305 - Contemporary Rhetorical Theory Credit Hours: 3
COM 365 - Electronic Comm & Society Credit Hours: 3
COM 415 - Dev Eff Multmdia Presntn Credit Hours: 3
JOUR 211 - Pub/Student Newspaper Credit Hours: 3
PWR 101 - Introduction to Professional Writing Credit Hours: 3
PWR 102 - Introduction to Web Authoring Credit Hours: 3
PWR 206 - Social Media Credit Hours: 3
PWR 215 - Writing in the Public Interest Credit Hours: 3
PWR 220 - Writing for Interactive Media Credit Hours: 3
PWR 306 - Writing for the Health Professions Credit Hours: 3
PWR 310 - Professional Writing for International Audiences Credit Hours: 3
PWR 315 - Advanced Web Authoring Credit Hours: 3
PWR 330 - User Research Credit Hours: 3
PWR 355 - Project Management for Writers Credit Hours: 3
WRI 328 - Style Credit Hours: 3
WRI 345 - Science Writing Credit Hours: 3
WRI 410 - Proposal & Grant Writing Credit Hours: 3
WRI 415 - Technical Editing Credit Hours: 3
WRI 420 - Document Design Credit Hours: 3

Dental Hygiene Department

Paula Russell, *Department Chair/Director, Klamath Falls*
Program Director: Paula Hendrix, BSDH in Salem at Chemeketa Community College; Suzanne Hopper - Online Degree Completion
Professor: S. Hopper
Associate Professor: P. Russell, P. Hendrix
Assistant Professors: K. Beaty, J. Luebbers, D. Swigart, T. Willey
Instructors: J. Bopp C. Botsch, E. Wells

Degrees Offered

- Bachelor of Science in Dental Hygiene (entry level program)
- Bachelor of Science in Dental Hygiene, Online Degree Completion (for licensed professionals)

The Bachelor of Science in Dental Hygiene is offered on the Oregon Tech campus in Klamath Falls, on the Chemeketa Community College campus in Salem, Oregon, and online for licensed professionals completing their Bachelor's degree.

Accreditation

The Dental Hygiene Program is accredited by the Commission on Dental Accreditation (CODA), a national Commission that is responsible for the professional accreditation of dental schools, dental hygiene programs, and other programs related to dentistry. Oregon Tech's Dental Hygiene Program's accreditation status is "approval without reporting requirements" which means it meets all of the "Accreditation Standards for Dental Hygiene Education Programs".

Program Purpose and Mission Statement

The Oregon Tech Dental Hygiene Program provides and educational environment that fosters respect and encourages critical thinking. Its mission is to educate students to become primary healthcare providers who are well prepared to serve the public in multiple roles and who are empowered to become life-long learners.

Upon graduation, students are prepared for entry into the dental hygiene profession and are eligible for state and national exams leading to licensure as a registered dental hygienist or expanded practice dental hygienist.

Program Educational Objectives

The dental hygiene graduate will be competent in:

1. Communication: Communication and collaborating with other members of the health care team to support comprehensive patient care
2. Critical Thinking and Problem Solving: Critical thinking and problem solving related to comprehensive care and management of patients
3. Professionalism, Ethical Practice: Applying ethical, legal, and regulatory concepts in the provision and/or support of oral health care services to comprehensive care and management of patients
4. Lifelong Learning: Demonstration competent knowledge and self-assessment skills necessary for life-long learning
5. Provision of Oral Health Care: Providing the dental hygiene process of care for a wide range of patient profiles and all types of periodontal diseases.
6. Community Health: Assessing, planning, implementing, and evaluating community based oral health programs including health promotion and disease prevention activities
7. Disease Prevention: Evaluate factors that can be used to promote patient adherence to disease prevention and/or health maintenance strategies.

Career Opportunities

Dental hygienists are most commonly employed in private dental practices and provide oral health preventive and therapeutic services. Graduates are prepared for licensure as a dental hygienist and graduate with the qualifications to obtain permits and endorsements for expanded practice in such settings as nursing homes, schools, and hospitals. In addition to clinical practice, dental hygienists have careers in the fields of education, research, administration, and public health.

Student Preparation

A science background is essential for individuals interested in any health sciences profession. Students considering a career in dental hygiene should take a college-bound course of study in high school that includes algebra, chemistry, and biology or human anatomy and physiology.

Admissions Procedures

Any student who meets the general admissions requirements may enroll in Pre-Dental Hygiene courses (freshman year). Students are selected to enter the professional program through an application process.

A limited number of seats are available in the professional program courses (sophomore, junior, and senior years).

The application deadline is in March of the calendar year of enrollment. To be eligible for admission into the Dental Hygiene Program the following minimum eligibility requirements must be met:

1. Applicants must have on file with the Oregon Tech Office of Admissions an official *Application for Admission* to Oregon Tech, accompanied by a $50 non-refundable fee and official transcripts of each college or university attended. Admission to Oregon Tech is independent of admission to the Dental Hygiene Program. All applicants to Oregon Tech are admitted as pre-dental hygiene majors until accepted into the dental hygiene program.
2. Applicants must have successfully completed or be in progress of completing all freshmen pre-dental hygiene courses. Introduction to Dental Hygiene (DH 100 on campus or DHE 100 online) must be taken through Oregon Tech. All other prerequisite (freshman) courses must be completed by the end of spring term, with the exception of BIO 233, which may be extended into the summer but must be successfully completed prior to program entry in the subsequent fall term.
3. Applicants must have a minimum cumulative 2.75 GPA in previous college work.

4. Applicants must submit a *Dental Hygiene Application for Admission*, related forms, and application fee of $75 to the Dental Hygiene department. Detailed information can be found on the Oregon Tech Dental Hygiene Program web page, www.oit.edu/dentalhygiene/how-to-apply.

Program Requirements

Dental hygiene students admitted to the Dental Hygiene Program (sophomore, junior, senior years) must purchase instruments and other supplies to be used during clinical practice and pay additional fees associated with dental hygiene courses. A background check, drug test, and proof of immunizations specific to healthcare workers are required prior to final admission into the professional program.

Graduation Requirements

All courses listed in the curriculum for the catalog year a student begins a program must be fulfilled. Total credits required for graduation are: Bachelor of Science degree, 190. A minimum cumulative grade point average (GPA) of 2.0 is required for graduation. Students must maintain a grade of "C" or better in all Dental Hygiene courses to continue in the program.

Dental Hygiene, BS

Curriculum

The following are required courses and recommended terms for students attending on the Klamath Falls campus. Please visit www.oit.edu/dentalhygiene for transfer information from other Oregon colleges and for recommended course sequencing for those attending on the Chemeketa Community College campus. Courses marked as "approved elective" may be chosen from the list in the Degree Emphasis list.

Pre-Dental Hygiene

Freshman Year Fall
BIO 200 - Medical Terminology Credit Hours: 2
BIO 231 - Human Anatomy/Physiology I Credit Hours: 4
DH 100 - Introduction to Dental Hygiene Credit Hours: 2
CHE Elective with Lab Credit Hours: 4+
Psychology Elective Credit Hours: 3
Total: 15 Credit Hours

Winter
BIO 105 - Microbiology Credit Hours: 4
BIO 232 - Human Anatomy/Physiology II Credit Hours: 4

MATH 111 - College Algebra Credit Hours: 4
or
MATH 243 - Introductory Statistics Credit Hours: 4

SOC 204 - Intro to Sociology Credit Hours: 3
WRI 121 - English Composition Credit Hours: 3
Total: 15 Credit Hours

Spring
BIO 205 - Nutrition Credit Hours: 3
BIO 233 - Human Anatomy/Physiology III Credit Hours: 4
SPE 111 - Public Speaking Credit Hours: 3
WRI 122 - Argumentative Writing Credit Hours: 3
Humanities Elective Credit Hours: 3
Total: 16 Credit Hours

Professional Courses

Sophomore Year Fall
DH 221 - Clinical Prac & Seminar I Credit Hours: 4
DH 225 - Head/Neck Anat, Histol, Embry Credit Hours: 3
DH 240 - Prevention I Credit Hours: 3
DH 266 - Dental Anatomy Credit Hours: 2
Humanities Elective Credit Hours: 3
Total: 15 Credit Hours

Winter
DH 222 - Clinical Prac & Seminar II Credit Hours: 4
DH 241 - Prevention II Credit Hours: 3
DH 244 - General and Oral Pathology Credit Hours: 3
DH 252 - Oral Radiology I Credit Hours: 3
DH 275 - Dental Ethics Credit Hours: 2
WRI 227 - Technical Report Writing Credit Hours: 3
Total: 18 Credit Hours

Spring
DH 223 - Clinical Prac & Seminar III Credit Hours: 3
DH 242 - Prevention III Credit Hours: 3
DH 253 - Oral Radiology II Credit Hours: 2
DH 254 - Introduction to Periodontology Credit Hours: 2
DH 267 - Emergency Procedures Credit Hours: 3
DH 380 - Comm Dentl Hlth I Credit Hours: 2
Total: 15 Credit Hours

Junior Year Fall
CHE 360 - Clinical Pharmacology/Hlth Prf Credit Hours: 3
DH 321 - Clinical Prac & Sem IV Credit Hours: 4
DH 340 - Prevention IV Credit Hours: 3
DH 354 - Periodontology Credit Hours: 3
DH 381 - Comm Dentl Hlth II Credit Hours: 2
SPE 321 Small Group/Team Comm Credit Hours: 3
Total: 18 Credit Hours

Winter
DH 322 - Clinical Prac & Sem V Credit Hours: 3
DH 341 - Prevention V Credit Hours: 3
DH 351 - Pain Management I Credit Hours: 3
DH 382 - Comm Dentl Hlth III Credit Hours: 2
Humanities Elective Credit Hours: 3
Total: 14 Credit Hours

Spring
DH 323 - Clinical Prac & Sem VI Credit Hours: 5
DH 344 - Adv General & Oral Pathology Credit Hours: 3
DH 352 - Pain Management II Credit Hours: 2
DH 363 - Dental Materials Credit Hours: 4
DH 370 - International Extrnshp I Credit Hours: 1 (optional)
DH 383 - Comm Dentl Hlth IV Credit Hours: 1
Total: 15/16 Credit Hours

Senior Year Summer
AHED 450 - Instructional Methods Credit Hours: 3
DH 421 - Clinical Prac & Sem VII Credit Hours: 4
DH 461 - Restorative Dentistry I Credit Hours: 2
Elective Credit Hours: 3 [a]
Social Science Elective Credit Hours: 3
Total: 15 Credit Hours

Fall
DH 372 - International Extrnshp III Credit Hours: 1 (optional)
DH 422 - Clinical Prac & Sem VIII Credit Hours: 5
DH 462 - Restorative Dentistry II Credit Hours: 2
DH 475 - EBDM in Healthcare I Credit Hours: 3
Communication Elective Credit Hours: 3
Elective Credit Hours: 3 [a]
Total: 16/17 Credit Hours

Winter
DH 423 - Clinical Prac & Sem IX Credit Hours: 5
DH 454 - Dental Prac Mgmt Credit Hours: 3
DH 463 - Restorative Dentistry III Credit Hours: 2
DH 476 - EBDM in Healthcare II Credit Hours: 3
Social Science Elective Credit Hours: 3
Total: 16 Credit Hours

Total for a B.S. in Dental Hygiene: 188-190 Credit Hours

Note: All transfer students must abide by the Dental Hygiene Transfer Guide posted on the Oregon Tech Dental Hygiene web page
[a] Elective selected from an advisor approved list

Electives Approved by the Dental Hygiene Department

Clinical Practice
BIO 336 - Essentials of Pathophysiology Credit Hours: 3
BIO 346 - Pathophysiology I Credit Hours: 3
BIO 347 - Pathophysiology II Credit Hours: 3
BUS 313 - Health Care Systems & Policy Credit Hours: 3
BUS 331 - Personal Finance Credit Hours: 3
COM 205 - Intercultural Comm Credit Hours: 3
PSY 301 - Basic Counseling Techniques Credit Hours: 4
PSY 336 - Health Psychology I Credit Hours: 3
PSY 337 - Health Psychology II Credit Hours: 3
PSY 347 - Organizational Behavior Credit Hours: 3
RCP 326 - Preparedness, Ethics, and Leadership Credit Hours: 2

Education
AHED 451 - Instructional Experience Credit Hours: 3
AHED 460 - Fund of Distance Education Credit Hours: 3
PSY 301 - Basic Counseling Techniques Credit Hours: 4
PSY 347 - Organizational Behavior Credit Hours: 3
SOC 225 - Medical Sociology Credit Hours: 3

Management
ACC 201 - Prin of Accounting I Credit Hours: 4
ACC 203 - Prin of Managerial Acct Credit Hours: 4
BUS 223 - Marketing I Credit Hours: 3
BUS 226 - Business Law Credit Hours: 3
BUS 308 - Prin of International Business Credit Hours: 3
BUS 313 - Health Care Systems & Policy Credit Hours: 3
BUS 317 - Health Care Management Credit Hours: 3
BUS 337 - Prin of Health Care Marketing Credit Hours: 3
BUS 345 - Fraud Examination Credit Hours: 3
BUS 349 - Human Resource Management I Credit Hours: 3
DH 465 - Dental Hygiene Entrepreneurship Credit Hours: 3
PHIL 342 - Business Ethics Credit Hours: 3
PSY 347 - Organizational Behavior Credit Hours: 3

Public Health
[a] Not currently offered online
BUS 313 - Health Care Systems & Policy Credit Hours: 3
COM 205 - Intercultural Comm Credit Hours: 3
DH 370 - International Extrnshp I Credit Hours: 1
DH 371 - International Extrnshp II Credit Hours: 1
DH 372 - International Extrnshp III Credit Hours: 1
DH 471 - Community Program Planning II Credit Hours: 3
PSY 347 - Organizational Behavior Credit Hours: 3
SOC 225 - Medical Sociology Credit Hours: 3
SOC 325 - Global Population Health Credit Hours: 3 [a]
SOC 335 - Hlth Inequal & Cult Competency Credit Hours: 3 [a]
WRI 410 - Proposal & Grant Writing Credit Hours: 3
WRI 510 - Grant Proposal Writing Credit Hours: 3

Dental Hygiene, Degree Completion, BS

This program offers dental hygienists who have earned an associate's degree the opportunity to complete a Bachelor of Science in Dental Hygiene. The degree is offered through Oregon Tech Online.

Dental hygienists who have graduated with an associate's degree from an accredited dental hygiene program may be eligible to apply to the bachelor's degree completion program. Oregon Tech will make every effort to give maximum consideration to the transfer work presented at time of application. Typically, most professional and related science requirements are accepted. Additional coursework may be necessary to meet Oregon Tech general education requirements and a minimum of 45 credit hours must be completed through Oregon Tech to satisfy residency requirements.

Graduation Requirements:

The following requirements must be met to earn a bachelor's degree in dental hygiene from Oregon Institute of Technology:

- Transfer your dental hygiene professional courses.
- Complete, or transfer, general education courses required for a bachelor's degree.
- Complete the bachelor's degree completion courses.
- Complete 60 credits of upper-division (300-400 level) coursework. (You will be awarded some upper-division credit for your transferred professional courses.)
- Complete at least 45 credits from Oregon Tech.
- Maintain a grade "C" or better in all courses.

Courses Granted for Licensure

DHE 100 - Introduction to Dental Hygiene Credit Hours: 2
DH 221 - Clinical Prac & Seminar I Credit Hours: 4
DH 222 - Clinical Prac & Seminar II Credit Hours: 4
DH 223 - Clinical Prac & Seminar III Credit Hours: 3
DH 225 - Head/Neck Anat, Histol, Embry Credit Hours: 3
DH 240 - Prevention I Credit Hours: 3
DH 241 - Prevention II Credit Hours: 3
DH 242 - Prevention III Credit Hours: 3
DH 244 - General and Oral Pathology Credit Hours: 3
DH 252 - Oral Radiology I Credit Hours: 3
DH 253 - Oral Radiology II Credit Hours: 2
DH 254 - Introduction to Periodontology Credit Hours: 2
DH 267 - Emergency Procedures Credit Hours: 3
DH 275 - Dental Ethics Credit Hours: 2
DH 321 - Clinical Prac & Sem IV Credit Hours: 4
DH 322 - Clinical Prac & Sem V Credit Hours: 3
DH 323 - Clinical Prac & Sem VI Credit Hours: 5
DH 340 - Prevention IV Credit Hours: 3
DH 341 - Prevention V Credit Hours: 3
DH 344 - Adv General & Oral Pathology Credit Hours: 3
DH 354 - Periodontology Credit Hours: 3
DH 363 - Dental Materials Credit Hours: 4
DH 266 - Dental Anatomy Credit Hours: 2
DH 380 - Comm Dentl Hlth I Credit Hours: 2
DH 381 - Comm Dentl Hlth II Credit Hours: 2
DH 421 - Clinical Prac & Sem VII Credit Hours: 4
DH 422 - Clinical Prac & Sem VIII Credit Hours: 5
DH 423 - Clinical Prac & Sem IX Credit Hours: 5

Completion Courses

[a] Credits may be granted for additional specialty licensure exams
AHED 450 - Instructional Methods Credit Hours: 3
BUS 317 - Health Care Management Credit Hours: 3
DH 401 - Overview Advanced Dental Hyg Credit Hours: 3
DH 454 - Dental Practice Mgmt Credit Hours: 3
DH 470 - Community Program Planning I Credit Hours: 3
DH 475 - EBDM in Healthcare I Credit Hours: 3
DH 476 - EBDM in Healthcare II Credit Hours: 3

MATH 111 College Algebra Credit Hours: 4
or
MATH 243 - Introductory Statistics Credit Hours: 4

SPE 321 - Small Group/Team Comm Credit Hours: 3
Communication Elective Credit Hours: 3
Humanities Elective Credit Hours: 3
Social Science Elective Credit Hours: 3
Elective Credit Hours: 3 (approved by advisor)
Elective Credit Hours: 3 (approved by advisor)
Elective Credit Hours: 3 (approved by advisor)

Additional Required General Education Courses

(Transfer or Oregon Tech)
BIO 105 - Microbiology Credit Hours: 4
BIO 200 - Medical Terminology Credit Hours: 2
BIO 205 - Nutrition Credit Hours: 3
BIO 231 - Human Anatomy/Physiology I Credit Hours: 4
BIO 232 - Human Anatomy/Physiology II Credit Hours: 4
BIO 233 - Human Anatomy/Physiology III Credit Hours: 4
CHE 101 - Intro to General Chemistry Credit Hours: 3
CHE 104 - Intro to General Chemistry Lab Credit Hours: 1
CHE 360 - Clinical Pharmacology/Hlth Prf Credit Hours: 3
SOC 204 - Intro to Sociology Credit Hours: 3
SPE 111 - Public Speaking Credit Hours: 3
WRI 121 - English Composition Credit Hours: 3
WRI 122 - Argumentative Writing Credit Hours: 3

WRI 123 - Research Writing Credit Hours: 3
or
WRI 227 - Technical Report Writing Credit Hours: 3

Humanities Elective Credit Hours: 3
Social Science Elective Credit Hours: 3
Social Science Elective Credit Hours: 3

Emergency Medical Services Department

Jamie Kennel, *Department Chair*
Jamie Kennel, *Program Director Paramedic Program*
Todd Ellingson, *Medical Director*
Assistant Professors: H. Jarrard, J. Kennel
Instructors: K. Darling, C. Hamper, S. Schmidt, A. Wagner

Degrees Offered

- Associate of Applied Science (AAS) in Paramedic (joint degree through Oregon Tech and OHSU).
- Bachelor of Science (BS) of Emergency Medical Services Management (joint degree through Oregon Tech and OHSU).

Career Opportunities

The EMS department provides a full spectrum of pre-hospital training programs and degrees, jointly offered by OHSU and Oregon Tech, starting from your very first EMS or general education course all the way through to completing your bachelor's degree, all created with collaboration from local and national industry leaders including:

- Emergency Medical Technician (EMT) Training and Certification
- Paramedic Training (AAS degree & Nationally Accredited)
- Critical Care Paramedic Training
- Community Care Paramedic / Mobile Integrated Health care Training
- EMS Management (Bachelor's degree)

Depending on your career aspirations, graduates find career employment in a variety of settings including ambulance transport agencies, fire and rescue agencies, air-medical transport agencies, medical support for industrial sites, tactical-medical teams, hospitals, and international aid missions, to name just a few.

The EMT and Paramedic program prepares students for entry positions in the pre-hospital medicine profession. Upon successful completion of the program, graduates are eligible to sit for the National Registry examination, which can lead to both national and state certifications.

Accreditation

While all programs at the university are accredited by the Northwest Commission on Colleges and Universities (NWCCU), where it is available and adds value to our students, our EMS programs offer additional programmatic accreditation. The Paramedic program is nationally accredited by The Commission on Accreditation of Allied Health Education Programs (www.caahep.org) upon the recommendation of the Committee on Accreditation of Educational Programs for the Emergency Medical Services Professions (CoAEMSP).

Admission Requirements

All courses offered by the EMS department require only general Oregon Tech admission with one exception: the second year of the Paramedic degree. Due to the large number of applications and relatively limited number of student positions, the second year of the paramedic degree is a competitive application process requiring a separate admissions step, further described on the Oregon Tech website (www.oit.edu/paramedic).

Whether you're an incoming freshman or preparing to transfer into one of our programs, students have been most successful when they focus and excel in the following three areas:

- Strong academic performance overall with an emphasis on science coursework performance
- Experience in providing pre-hospital care (e.g. volunteer, intern, BLS transports, etc.) ideally with hands-on direct patient care
- Strong customer service experience with the public

All prospective students are encouraged to meet with the EMS department Program Coordinator to review transcripts and develop a customized plan to get started.

Emergency Medical Services Management, Community Care Track, BS

Curriculum

The following are required courses and recommended terms for students wishing to meet the AAS and BS degree requirements. All courses listed on the curriculum map in the catalogue year a student begins a program must be fulfilled for graduation eligibility.
Required courses and recommended terms during which they should be taken:

Freshman Year Fall
BIO 200 - Medical Terminology Credit Hours: 2
BIO 231 - Human Anatomy/Physiology I Credit Hours: 4
EMS 151 - Emerg Med Tech (EMT) I Credit Hours: 6
MATH 111 - College Algebra Credit Hours: 4
Total: 16 Credit Hours

Winter
BIO 232 - Human Anatomy/Physiology II Credit Hours: 4
EMS 152 - Emerg Med Tech (EMT) II Credit Hours: 6
SPE 111 - Public Speaking Credit Hours: 3
WRI 121 - English Composition Credit Hours: 3
Total: 16 Credit Hours

Spring
BIO 233 - Human Anatomy/Physiology III Credit Hours: 4
EMS 115 - Introduction to EMS Credit Hours: 3
PSY 201 - Psychology Credit Hours: 3
WRI 122 - Argumentative Writing Credit Hours: 3
Humanities Elective Credit Hours: 3
Total: 16 Credit Hours

Paramedic Professional Courses (Additional Application Required)

Sophomore Year Fall
CHE 210 - Clinical Pharmacology Credit Hours: 3
EMS 218 - Trauma Emergencies Credit Hours: 3
EMS 231 - Medical Emergencies Credit Hours: 4
EMS 235 - Basic Electrocardiography Credit Hours: 3
EMS 241 - Paramed Crisis Resrce Mgmt I Credit Hours: 3
EMS 271 - Paramedic Skills Lab I Credit Hours: 3
Total: 19 Credit Hours

Winter
EMS 211 - Prehospital Emerg Pharmacology Credit Hours: 3
EMS 232 - Medical Emergencies II Credit Hours: 3
EMS 236 - Advanced Electrocardiography Credit Hours: 3
EMS 242 - Paramed Crisis Resrce Mgmt II Credit Hours: 1
EMS 272 - Paramedic Skills Lab II Credit Hours: 2

EMS 283 - Clinical Practicum I Credit Hours: 6
or
EMS 284 - Clinical Practicum II Credit Hours: 6
Total: 18 Credit Hours

Spring
EMS 233 - Medical Emergencies III Credit Hours: 3
EMS 273 - Paramedic Skills Lab III Credit Hours: 1
EMS 243 - Paramed Crisis Resrce Mgmt III Credit Hours: 1

EMS 283 - Clinical Practicum I Credit Hours: 6
or
EMS 284 - Clinical Practicum II Credit Hours: 6

EMS 291 - Pramed Field Extern Practic I Credit Hours: 4
Total: 15 Credit Hours

Summer
EMS 292 - Paramed Field Extern Prac II Credit Hours: 12
Total: 12 Credit Hours

Junior Year Fall
BUS 317 - Health Care Management Credit Hours: 3
BUS 337 - Prin of Health Care Marketing Credit Hours: 3
EMS 321 - Community Paramedic I Credit Hours: 4
EMS 341 - Community Para Clinical I Credit Hours: 2
Total: 12 Credit Hours

Winter
BUS 313 - Health Care Systems & Policy Credit Hours: 3
ECO 202 - Principles of Macroeconomics Credit Hours: 3
EMS 322 - Community Paramedic II Credit Hours: 4
EMS 342 - Community Para Clinical II Credit Hours: 2
Total: 12 Credit Hours

Spring
ECO 201 - Principles of Microeconomics Credit Hours: 3
WRI 227 - Technical Report Writing Credit Hours: 3
PSY 347 - Organizational Behavior Credit Hours: 3
SPE 321 - Small Group/Team Comm Credit Hours: 3
Humanities - 300 or 400 Elective Credit Hours: 3
Total: 15 Credit Hours

Senior Year Fall
BUS 349 - Human Resource Management I Credit Hours: 3
MATH 361 - Statistical Methods I Credit Hours: 4
PHIL 331 - Ethics in the Professions Credit Hours: 3
WRI 327 - Advanced Tech Writing Credit Hours: 3
Total: 13 Credit Hours

Winter
BUS 316 - Total Quality Health Care Credit Hours: 3
EMS 496 - EMS Capstone Project I Credit Hours: 3
EMS 456 - Research Methods in EMS Credit Hours: 2
MATH 362 - Statistical Methods II Credit Hours: 4
Math, Science, or Social Science Elective (upper division) Credit Hours: 3
Total: 15 Credit Hours

Spring
BUS 467 - Service Management Credit Hours: 3
EMS 497 - EMS Capstone Project II Credit Hours: 3
EMS 444 - EMS Systems, Lead & Mgt Credit Hours: 3
Math, Science, or Social Science Elective (upper division) Credit Hours: 4
Total: 13 Credit Hours

Total for a B.S. in Emergency Medical Services Management Community Care Track: 192 Credit Hours

Emergency Medical Services Management, Critical Care Track, BS

Curriculum

The following are required courses and recommended terms for students wishing to meet the AAS and BS degree requirements. All courses listed on the curriculum map in the catalogue year a student begins a program must be fulfilled for graduation eligibility.

Required courses and recommended terms during which they should be taken:

Freshman Year Fall
BIO 200 - Medical Terminology Credit Hours: 2
BIO 231 - Human Anatomy/Physiology I Credit Hours: 4
EMS 151 - Emerg Med Tech (EMT) I Credit Hours: 6
MATH 111 - College Algebra Credit Hours: 4
Total: 16 Credit Hours

Winter
BIO 232 - Human Anatomy/Physiology II Credit Hours: 4
EMS 152 - Emerg Med Tech (EMT) II Credit Hours: 6
SPE 111 - Public Speaking Credit Hours: 3
WRI 121 - English Composition Credit Hours: 3
Total: 16 Credit Hours

Spring
BIO 233 - Human Anatomy/Physiology III Credit Hours: 4
EMS 115 - Introduction to EMS Credit Hours: 3
PSY 201 - Psychology Credit Hours: 3
WRI 122 - Argumentative Writing Credit Hours: 3
Humanities Elective Credit Hours: 3
Total: 16 Credit Hours

Paramedic Professional Courses(Additional Application Required)

Sophomore Year Fall
CHE 210 - Clinical Pharmacology Credit Hours: 3
EMS 218 - Trauma Emergencies Credit Hours: 3
EMS 231 - Medical Emergencies Credit Hours: 4
EMS 235 - Basic Electrocardiography Credit Hours: 3
EMS 241 - Paramed Crisis Resrce Mgmt I Credit Hours: 3
EMS 271 - Paramedic Skills Lab I Credit Hours: 3
Total: 19 Credit Hours

Winter
EMS 211 - Prehospital Emerg Pharmacology Credit Hours: 3
EMS 232 - Medical Emergencies II Credit Hours: 3
EMS 236 - Advanced Electrocardiography Credit Hours: 3
EMS 242 - Paramed Crisis Resrce Mgmt II Credit Hours: 1
EMS 272 - Paramedic Skills Lab II Credit Hours: 2

EMS 283 - Clinical Practicum I Credit Hours: 6
or
EMS 284 - Clinical Practicum II Credit Hours: 6
Total: 18 Credit Hours

Spring
EMS 233 - Medical Emergencies III Credit Hours: 3
EMS 273 - Paramedic Skills Lab III Credit Hours: 1
EMS 243 - Paramed Crisis Resrce Mgmt III Credit Hours: 1

EMS 283 - Clinical Practicum I Credit Hours: 6
or
EMS 284 - Clinical Practicum II Credit Hours: 6

EMS 291 - Pramed Field Extern Practic I Credit Hours: 4
Total: 15 Credit Hours

Summer
EMS 292 - Paramed Field Extern Prac II Credit Hours: 12
Total: 12 Credit Hours

Junior Year Fall
BUS 317 - Health Care Management Credit Hours: 3
BUS 337 - Prin of Health Care Marketing Credit Hours: 3
ECO 201 - Principles of Microeconomics Credit Hours: 3
WRI 227 - Technical Report Writing Credit Hours: 3
Total: 12 Credit Hours

Winter
BUS 313 - Health Care Systems & Policy Credit Hours: 3
ECO 202 - Principles of Macroeconomics Credit Hours: 3
EMS 331 - Critical Care Transport Credit Hours: 4
EMS 381 - Crit Care Clin Pract I Credit Hours: 1
Total: 11 Credit Hours

Spring
EMS 332 - Critical Care Transport II Credit Hours: 3
EMS 382 - Crit Care Clin Pract II Credit Hours: 3
HUM - 300 or 400 Elective Credit Hours: 3
PSY 347 - Organizational Behavior Credit Hours: 3
SPE 321 - Small Group/Team Comm Credit Hours: 3
Total: 15 Credit Hours

Senior Year Fall
BUS 349 - Human Resource Management I Credit Hours: 3
MATH 361 - Statistical Methods I Credit Hours: 4
PHIL 331 - Ethics in the Professions Credit Hours: 3
WRI 327 - Advanced Tech Writing Credit Hours: 3
Total: 13 Credit Hours

Winter
BUS 316 - Total Quality Health Care Credit Hours: 3
EMS 496 - EMS Capstone Project I Credit Hours: 3
EMS 456 - Research Methods in EMS Credit Hours: 2
MATH 362 - Statistical Methods II Credit Hours: 4
Math, Science, or Social Science Elective (upper division) Credit Hours: 3
Total: 15 Credit Hours

Spring
BUS 467 - Service Management Credit Hours: 3
EMS 497 - EMS Capstone Project II Credit Hours: 3
EMS 444 - EMS Systems, Lead & Mgt Credit Hours: 3
Math, Science, or Social Science Elective (upper division) Credit Hours: 3
Total: 12 Credit Hours

Total for a B.S. in Emergency Medical Services Management Critical Care Track: 190 Credit Hours

Emergency Medical Technology Paramedic, AAS

Curriculum

The following are required courses and recommended terms for students wishing to meet the AAS and BS degree requirements. All courses listed on the curriculum map in the catalogue year a student begins a program must be fulfilled for graduation eligibility.

Required courses and recommended terms during which they should be taken:

Freshman Year Fall
BIO 231 - Human Anatomy/Physiology I Credit Hours: 4
EMS 151 - Emerg Med Tech (EMT) I Credit Hours: 6
MATH 100 - Intermediate Algebra Credit Hours: 4
WRI 121 - English Composition Credit Hours: 3
Total: 17 Credit Hours

Winter
BIO 232 - Human Anatomy/Physiology II Credit Hours: 4
EMS 152 - Emerg Med Tech (EMT) II Credit Hours: 6
SPE 111 - Public Speaking Credit Hours: 3
Total: 13 Credit Hours

Spring
BIO 200 - Medical Terminology Credit Hours: 2
BIO 233 - Human Anatomy/Physiology III Credit Hours: 4
EMS 115 - Introduction to EMS Credit Hours: 3
PSY 201 - Psychology Credit Hours: 3
Total: 12 Credit Hours

Paramedic Professional Courses (Additional Application Required)

Sophomore Year Fall
CHE 210 - Clinical Pharmacology Credit Hours: 3
EMS 218 - Trauma Emergencies Credit Hours: 3
EMS 231 - Medical Emergencies Credit Hours: 4
EMS 235 - Basic Electrocardiography Credit Hours: 3
EMS 241 - Paramed Crisis Resrce Mgmt I Credit Hours: 3
EMS 271 - Paramedic Skills Lab I Credit Hours: 3
Total: 19 Credit Hours

Winter
EMS 211 - Prehospital Emerg Pharmacology Credit Hours: 3
EMS 232 - Medical Emergencies II Credit Hours: 3
EMS 236 - Advanced Electrocardiography Credit Hours: 3
EMS 242 - Paramed Crisis Resrce Mgmt II Credit Hours: 1
EMS 272 - Paramedic Skills Lab II Credit Hours: 2
EMS 283 - Clinical Practicum I Credit Hours: 6
Total: 18 Credit Hours

Spring
EMS 233 - Medical Emergencies III Credit Hours: 2
EMS 237 - Paramedic 12-Leads Credit Hours: 1
EMS 243 - Paramed Crisis Resrce Mgmt III Credit Hours: 1
EMS 273 - Paramedic Skills Lab III Credit Hours: 1
EMS 284 - Clinical Practicum II Credit Hours: 6
EMS 291 - Pramed Field Extern Practic I Credit Hours: 4
Total: 15 Credit Hours

Summer
EMS 292 - Paramed Field Extern Prac II Credit Hours: 12
Total: 12 Credit Hours

Total Credit Hours for A.A.S. Degree in EMT – Paramedic: Technical Total: 64 Credit Hours

Degree Total: 106 Credit Hours

Humanities and Social Sciences Department

Mark Neupert, *Department Chair*
Kathleen Adams, *Program Director, Marriage and Family Therapy*
Alishia Huntoon, *Program Director, Extern Coordinator and Curriculum Coordinator, Applied Psychology - Online*
Maria Lynn Kessler, *Program Director Applied Psychology - Portland-Metro, Program Director Applied Behavior Analysis*
Trevor Petersen, *Program Director, Applied Psychology - Klamath Falls*
Professors: M. Clark, M. Kessler, M. Neupert
Associate Professors: K. Adams, D. Bailey, B. Bunting, A. Huntoon, R. Madden, S. Nathenson, T. Petersen, Y. Rowher
Assistant Professors: J. Borgen, K. Chapman, C. Fitzgerald, K. Garrett, C. Torgerson
Instructor: S. Machado

Degrees Offered

- Master of Science
  - Applied Behavior Analysis
  - Marriage and Family Therapy

- Bachelor of Science in:
  - Applied Psychology
  - Population Health Management

Minors Offered

- Arts, Literature, and Philosophy (ALPs)
- Medical Sociology
- Psychology

Graduate Certificates Offered

- Applied Behavior Analysis (ABA)

Module Offered

- Oregon Transfer (OTM)

The Humanities and Social Sciences Department offers a wide variety of classes that meet the general education requirements for all students. In addition, these classes meet the lower-division requirements for college transfer students in many pre-professional programs.

Department Goals and Objectives

1. To provide coursework in the humanities and social sciences in order to prepare students for employment in a rapidly changing global market.
2. To provide course offerings in multiculturalism and globalization.
3. To assist students in developing critical thinking and problem-solving abilities and to develop scientific knowledge and inquiry skills.
4. To assist students in developing ethical and cultural awareness.
5. To prepare students to be responsible citizens and lifelong learners.
6. To assist students in developing an aesthetic appreciation of the arts.

Applied Behavior Analysis

MariaLynn Kessler, *Program Director*
Dawn Bailey, *Practicum Coordinator*
John Borgen, *VCS Coordinator*
Participating Faculty: D. Bailey, J. Borgen, M. Kessler

Degree Offered

- Master of Science in Applied Behavior Analysis

Certificate Offered

- Applied Behavior Analysis Graduate Certificate

Oregon's only master's degree in applied behavior analysis, the MS-ABA curriculum focuses on providing a rigorous and thorough foundation in the science of behavior analysis. Students will be prepared to apply the principles of behavior analysis with diverse populations and in a wide variety of settings. Oregon Tech's MS-ABA prepares students to meet national certification and Oregon licensure requirements.

Courses are taught on the Klamath Falls and Portland-Metro campuses and are available to students everywhere via Zoom (a synchronous videoconferencing program). The use of Zoom technology provides an alternative to fully online, asynchronous programs for students in all areas of the state who prefer the real-time, face-to-face educational experience.

Program Mission

The mission of the MS-ABA program is to enable students to become effective and ethical behavior analysts. Students will be prepared to apply principles of behavior analysis to enhance the lives of individuals across a wide variety of settings. The program emphasizes a foundation in theory, concepts, and principles, development of basic behavior analytic skills, and an emphasis on professional and ethical responsibilities.

Program Objectives

1. To produce competent graduates who can work effectively and ethically across settings and with diverse populations
2. To enable students to obtain the knowledge and skills necessary for immediate employment in ABA and/or further graduate study in ABA and related areas
3. To prepare students for national certification and Oregon licensure as behavior analysts

Licensure and Certification

MS-ABA prepares students to meet national certification and Oregon licensure requirements. The program includes the Behavior Analysts Certification Board® verified course sequence and an intensive practicum experience that meets national certification requirements for supervised experience

BCBA course sequence: the Association for Behavior Analysis-International has verified these courses as meeting the coursework requirements for eligibility to take the Board Certified Behavior Analyst® exam. (Applicants will have to meet additional requirements to qualify)

ABA Practicum: second year practicum placements provide students with the opportunity for supervised experience. Practicum placements may be paid or unpaid positions with approved ABA agencies and, in Klamath Falls, with Oregon Tech's BIG ABA clinic and local schools

Admissions

In order to ensure that students have the necessary preparation for success in the MS-ABA program, applicants must meet the Oregon Tech requirements for admission as well as the MS-ABA program specific requirements.

Applicants to the MS-ABA program at Oregon Tech shall meet the following requirements:

- Bachelor's Degree: Bachelor's degree from an accredited four-year institution in Psychology or a related field.
- GPA: Overall undergraduate GPA of 3.0 on a 4.0 scale and 3.0 for the last 90 quarter credits (60 semester) credits of coursework.
- Undergraduate Coursework: A grade of B or better in General Psychology, Research Methods, and Statistics.
- Academic Standing: Be in good academic standing at last college or university attended.
- GRE Scores: Graduate Record Examination scores for Verbal Reasoning at 150, for Quantitative Reasoning at 141, and for Analytical Writing at 3.5. GRE scores over five years old are not accepted.
- Personal Statement and Resume: Applicants will be required to write a statement that addresses career goals and relevance to the program, evidence of aptitude for graduate work and evidence of potential for success in the field.
- Reference Letters: Applicants to the program will be required to provide three letters of reference (at least one academic and one professional) that address the applicant's preparation, abilities, and character.
- Background Check: Due to the sensitive nature of this program in regards to work with children and/or vulnerable populations, applicants must pass a criminal background check such as that conducted by the Oregon Department of Human Services (DHS).
- The department and university can grant conditional admission to candidates not meeting all of the minimum requirements.

Applied Behavior Analysis

Applied Behavior Analysis (ABA) is an evidence-based, data-driven, systematic approach to intervention. Practitioners of ABA apply principles of reinforcement and focus on applications that improve the quality of life for individuals. Behavior analysts provide services in a variety of settings including schools, clinics, rehabilitation settings, residential facilities, social service agencies, mental health facilities, businesses, and client homes. They work with diverse populations including individuals and families affected by autism, developmental and intellectual disabilities, brain injury, mental health, geriatrics, child abuse, and neglect.

Program Objective

Meet the demand for competent behavior analysts by providing BACB® approved course work to professionals seeking national certification and/or licensure as a behavior analyst in Oregon.

Marriage and Family Therapy

Kathleen M. Adams, *Program Director*
Participating Faculty: K. Adams, K. Garrett, C. Torgerson

Degree Offered

Master of Science in Marriage and Family Therapy (MS MFT): A comprehensive 90 credit, three-year program, the MS MFT is offered on Oregon Tech's Klamath Falls campus with a course schedule designed for working adults: most classes are offered in the evening, on weekends, and blended delivery courses.

Program Mission Statement

Oregon Tech's Master of Science in Marriage and Family Therapy program prepares graduates to become skilled Marriage and Family Therapists with multicultural competence, expertise in rural mental health care, medical family therapy and substance use disorders and addictions treatment.

In strong collaboration with local child and family service organizations, health care and mental health care providers, the MS MFT program supports and strengthens mental health care and child and family services in the under-served rural areas that are southern Oregon and northern California.

Program Objectives

Strong Curriculum

Oregon Tech's MS MFT program delivers a strong, comprehensive curriculum designed to meet curriculum requirements of the Oregon State Board of Licensed Counselors and Therapists, and the Commission on Accreditation of Marriage and Family Therapy Education (COAMFTE) programs. The MS MFT program prepares students to become leaders in the field, with particular focus on mental health care and child and family services in rural areas, medical family therapy, and, substance abuse disorders and addiction treatment.

Community Service
Oregon Tech's MS MFT program supports and strengthens rural mental health care and child and family services, in southern Oregon and northern California.

Continuing Education
Oregon Tech's MS MFT program provides contemporary, immediately applicable continuing education seminars and conferences to educate and instruct the general public, program staff in public and private service organizations, and students and professionals. The MS MFT program also assists other organizations in conducting similar activities.

Oregon Tech's MS MFT is Unique

Integrated Behavioral Healthcare ~ Medical Family Therapy
MS MFT students develop the knowledge and skills required to become indispensable leaders in the rapidly developing multidisciplinary field of Integrated Behavioral Healthcare and Medical Family Therapy.

Mental Health Care in Under-Served and Rural Areas
Mental health care needs in rural areas, like southern Oregon, provide unique challenges that require unique approaches. Oregon Tech's MS MFT students develop the expertise and skills required to excel as rural mental health care providers.

Substance Abuse and Addiction Treatment
Oregon Tech MFT students are well prepared to work with individuals, couples and families struggling with substance abuse and addiction. From a trauma and recovery informed perspective, students learn the advanced knowledge and skills required to work well with substance abuse, mental health, and co-occurring disorders; and the impact of the same on couples and families.

Community Involvement
Strong community collaboration allows students to work in area child and family service agencies, part-time, from the beginning of their studies. Additionally, a limited number of Graduate Assistantship are awarded for program support in community agencies.

Career Success
Committed to helping students excel in their careers, faculty in Oregon Tech's MS MFT program mentor students beyond graduation, through completion of post grad clinical hours and licensing exams.

Career Opportunities

MFT's are trained in both psychotherapy and in family systems, which allows them to focus on understanding client symptoms in the context of the relational interactions that influence behavior. Family-based therapy is a powerful model for change. Research has shown that family-based interventions such as those utilized by MFTs are as effective as–and in many cases more effective than–alternative therapies, often at a lower cost. MFTs apply a holistic perspective to health care; they are concerned with the overall, long-term well-being of individuals and their families. Whoever the client, MFTs view problems from a relationship perspective.

Admission

MFTs come from a wide variety of backgrounds including social studies, psychology, religious studies, the humanities, nursing, pastoral counseling, and education. The field is founded in multidisciplinary studies, the rich traditions of the humanities and social sciences, and in the practical approaches of psychology.

The application and selection process identifies candidates with strong academic skills, maturity, experience, and clinical and leadership potential. Successful applicants submit a personal essay, academic transcripts and recommendations from professionals familiar with applicant maturity and academic and clinical potential. Selected applicants participate in interviews with the Admissions Committee.

Applied Psychology

Alishia Huntoon, *Program Director, Online, Externship Coordinator*
MariaLynn Kessler, *Program Director, Portland-Metro*
Trevor Petersen, *Program Director, Klamath Falls, Advising Coordinator*
Participating Faculty: J. Borgen, C. Fitzgerald, A. Huntoon, M. Kessler, T. Petersen

Degree Offered

- Bachelor of Science in Applied Psychology

The Bachelor of Science in Applied Psychology prepares students for careers that apply the principles of psychology in diverse settings. The program provides a strong core curriculum in order for students to understand the foundations, theories, and principles of each area of psychology. As an applied program, both core and elective courses have a skills-based focus, allowing students to identify personal strengths, apply knowledge to real-world situations, create and implement new ideas, and ultimately be prepared to enter the workforce or continue on to graduate programs. A diverse offering of elective courses allows for students to focus on one or many areas of psychology, creating a unique opportunity for students to have an in-depth and personalized psychology degree. Students should consult with their advisor about specific interests for guidance in regard to elective offerings. The Applied Psychology program also offers Capstone in Applied Psychology (CAP) courses. These CAP courses vary by term and give senior students the opportunity to synthesize knowledge learned throughout the degree program and apply core principles and theories of psychology to a selected topic. Through an Applied Experience, students have the opportunity to participate in externships, advanced research courses, or community work to prepare themselves for exciting and rewarding careers in psychology or for additional course work in graduate programs.

Mission Statement

The mission of the Applied Psychology Program is to enable students to apply core principles and theories of psychology and in-depth knowledge and skills in specific areas of psychology to communicate effectively, think critically, behave ethically and with cultural awareness, and work inter-personally with people from a wide variety of backgrounds.

Career Opportunities

Nationwide, college graduates with a bachelor's in psychology perform a wide variety of jobs or attend a wide variety of graduate programs. Graduates may work in counseling, education, social service, management, public relations, public health, and other fields. All of these jobs are potentially available to graduates of Oregon Tech's Applied Psychology Program. Many of Oregon Tech's Applied Psychology graduates have found jobs in Oregon and beyond. Human service employers include county and state agencies, as well as a wide range of private and non-profit agencies. Graduates of Oregon Tech's Applied Psychology Program benefit from the emphasis of hands-on training and applied experiences. Graduates have also completed a Master of Arts in Teaching (MAT) and pursue careers in education, such as teaching, school counseling, and special education. Graduates have also been employed in industry and are following management training programs. Finally, graduates have pursued various master's and doctoral programs in psychology and related fields.

Population Health Management

Sophia Lyn Nathenson, *Program Director, Externship Coordinator*
Kyle Chapman, *Assistant Program Director, Advising Coordinator*
Participating Faculty: K. Chapman, S. Nathaenson

Degree Offered

- Bachelor of Science in Population Health Management

The Population Health Management (PHM) professions are auxiliary or complementary to clinical health care. The PHM B.S. degree program includes core courses in applied and medical sociology, in addition to electives in applied psychology, management, mathematics, communication, and health sciences. Students may choose one of three emphases: Health Counseling/Outreach, Care Management and Coordination, and Applied Health Data Analytics.

The PHM program begins with a foundation in sociological theory, methods and research.

PHM graduates will gain competence in social theory, research methods, statistics, program planning and evaluation, and training in working with diverse and under-served populations.

Mission Statement

The mission of the PHM program is to provide students with the best possible training for careers that improve health and well-being. As the United States health care system changes to adapt to a new demographic and health landscape, increasing emphasis is placed on preventative medicine and health maintenance. PHM graduates will help fill this pressing need, providing much needed health resources to hospitals, schools, governmental and non-profit organizations, and local communities. Such work empowers individuals through health programs and policy, to create a healthier future for our nation.

Career Opportunities

Students who graduate from the PHM program may work in a wide variety of settings, all with the intent of improving the health and well-being of individuals and communities. Careers include health coaching, health research, community health program and evaluation, education, and patient advocacy. The PHM degree is an ideal preparation for graduate study in sociology, epidemiology, public health and medicine.

Oregon Transfer Module (OTM)

The Oregon Transfer Module (OTM) provides a one-year curriculum for students who plan to transfer to a State of Oregon community college or university. The module allows students to complete one year of general education foundation course work that is academically sound and will meet the admission standards of the receiving school. Students should work closely with an academic advisor to ensure selection of appropriate course work. Upon transfer, students may be required to complete additional course work in general education or an academic major specific to the receiving institution. Students who transfer prior to the completion of the Oregon Transfer Module will have their courses individually evaluated by the receiving institution. Students must complete a minimum of 45 credits of lower division course work with a grade of "C-" or better in order to receive credit for the Oregon Transfer Module. A minimum of 12 credits must be earned at Oregon Tech. The following courses may be used to complete the Oregon Transfer Module:

FOUNDATIONAL SKILLS

Writing and Oral Communication

Writing
Two courses of college level composition

Oral Communication
One course of Public Speaking or Communication

Mathematics
One course of College level Math

INTRODUCTION TO DISCIPLINES

Arts and Letters/Humanities
3 courses of Arts and letters/Humanities
Oregon Tech only allows 3 credits of performance or studio-based courses in this category

Science/Math/Computer Science
3 courses, including at least one biological or physical science with a laboratory

Social Science
3 courses of Social Science

Applied Behavior Analysis, MS

Curriculum

Required courses and recommended terms during which they should be taken:

First Year Fall
ABA 501 - ABA Colloquium Credit Hours: 1
ABA 511 - Foundations of ABA I Credit Hours: 3 [b]
ABA 515 - Basic Behavior Analysis Credit Hours: 3
ABA 521 - Ethics & Professional Issues I Credit Hours: 3 [b]
Total: 10 Credit Hours

Winter
ABA 501 - ABA Colloquium Credit Hours: 1
ABA 512 - Foundations of ABA II Credit Hours: 3 [b]
ABA 526 - Behavioral Assessment Credit Hours: 3 [b]
ABA 527 - Radical Behaviorism Credit Hours: 3
Total: 10 Credit Hours

Spring
ABA 501 - ABA Colloquium Credit Hours: 1
ABA 516 - ABA and Human Development Credit Hours: 3
ABA 525 - Research Methods in ABA Credit Hours: 3 [b]
ABA 531 - Behavioral Change I Credit Hours: 3 [b]
Total: 10 Credit Hours

Summer
ABA 535 - Special Topics in ABA Credit Hours: 3 [b]
ABA 598 - Supervised Practicum Credit Hours: 2 [a]
Total: 5 Credit Hours

Second Year Fall
ABA 522 - Ethics & Profess Issues II Credit Hours: 3 [b]
ABA 532 - Behavioral Change II Credit Hours: 3 [b]
ABA 598 - Supervised Practicum Credit Hours: 2 [a]
ABA 599 - Thesis Credit Hours: 1
Total: 9 Credit Hours

Winter
ABA 536 - Behavior, Physiology, and Pharmacology Credit Hours: 3
ABA 598 - Supervised Practicum Credit Hours: 2 [a]
ABA 599 - Thesis Credit Hours: 1
ABA Elective Credit Hours: 3
Total: 9 Credit Hours

Spring
ABA 598 - Supervised Practicum Credit Hours: 2 [a]
or
ABA Elective Credit Hours: 3

ABA 599 - Thesis Credit Hours: 1
ABA Elective Credit Hours: 3
ABA Elective Credit Hours: 3
Total: 9/10 Credit Hours

Elective Courses

ABA 565 - Organizational Behavior Management Credit Hours: 3
ABA 566 - ABA and Education Credit Hours: 3
ABA 567 - ABA and Health Credit Hours: 3
ABA 575 - Community Behavior Analysis Credit Hours: 3
ABA 576 - Clinical Behavior Analysis Credit Hours: 3
ABA 577 - ABA and Special Populations Credit Hours: 3

Total for a M.S. in Applied Behavior Analysis: 62/63 Credit Hours

[a] Practicum Fee of $xx (professional liability coverage)
[b] BCBA course sequence

Marriage and Family Therapy, MS

Degree Requirements

The MS MFT requires successful completion of 90 credits of MS MFT graduate coursework. Courses are delivered in lockstep order, with prerequisites for each term offered in the previous term.

Required Coursework

MFT 500 - Child & Adolescent Development Credit Hours: 3
MFT 501 - Adult Development Credit Hours: 3
MFT 510 - Introduction to MFT Credit Hours: 3
MFT 511 - Fmly Therapy Theory & Prac I Credit Hours: 3
MFT 512 - Fmly Therapy Theory & Prac II Credit Hours: 3
MFT 515 - MFT Practicum
MFT 516 - MFT Practicum
MFT 517 - MFT Practicum
MFT 520 - Counseling: Theory & Skills Credit Hours: 3
MFT 521 - Child & Adolescent Therapy Credit Hours: 3
MFT 522 - Couples Therapy Credit Hours: 3
MFT 523 - Group Therapy Credit Hours: 3
MFT 524 - Play Therapy Credit Hours: 3
MFT 525 - Trauma and Recovery Credit Hours: 3
MFT 531 - Child & Adolescent Psycho & Dx Credit Hours: 3
MFT 530 - Adult Psychopathology & Dx Credit Hours: 3
MFT 532 - Psychopathology & the Family Credit Hours: 3
MFT 533 - Violence & Abuse in Int. Rel. Credit Hours: 3
MFT 534 - Psychological Assessment Credit Hours: 3
MFT 540 - Research Methods Credit Hours: 4
MFT 550 - Professional Studies: Ethics Credit Hours: 3
MFT 560 - Dev. Cultural Competencies Credit Hours: 3
MFT 561 - Sexuality and Therapy Credit Hours: 3
MFT 562 - Rural Mental Health Care Credit Hours: 3
MFT 563 - Psychopharmacology Credit Hours: 3
MFT 564 - Sub. Abuse & Co-Occurring Dis. Credit Hours: 3
MFT 565 - Mental Health Care & Tech. Credit Hours: 3
MFT 566 - Med. Family Therapy in Rural Credit Hours: 3
MFT 570 - Internship I
MFT 571 - Internship II
MFT 572 - Internship III
MFT 580 - Independent Study in Marriage and Family Therapy
MFT 585 - Special Project or Training in Marriage and Family Therapy
MFT 590 - Clinical Capstone I
MFT 591 - Clinical Capstone II

Applied Psychology, BS

Degree Requirements

Students must meet the general education requirements, as stated below, and satisfactorily complete the courses listed in this curriculum to obtain the Bachelor of Science in Applied Psychology. A total of 180 credits are required for the degree. Students must complete a core program consisting of 71 credits; those core courses are PSY 201, PSY 202, PSY 203, PSY 215, PSY 216, PSY 301, PSY 311, PSY 312, PSY 313, PSY 317, PSY 330, PSY 331, PSY 334, PSY 335, PSY 339, PSY 455, PSY 475, PSY 255 or MATH 243 or MATH 361, and 12 credits toward an Applied Experience. Any of the following can count toward the Applied Experience: PSY 314, PSY 420, PSY 421, PSY 422, PSY 423, PSY 441, PSY 442, PSY 443, PSY 445, and/or PSY 497. Additionally, students are required to take 54 elective credits, and should work with their advisors to select elective courses that align closely with their interests and career goals. Students electing to take externship are restricted to a maximum of 32 credits. All core courses must be completed with a minimum grade of "C" in order to earn the degree.

Note: The Portland-Metro campus is a laptop-required campus with resources like laptop specifications, financial aid, and helpful instructions found at http://www.oit.edu/portland-metro/college-costs/bring-your-own-device.

Curriculum

Required courses and recommended terms during which they should be taken:

Freshman Year Fall
PSY 201 - Psychology Credit Hours: 3
WRI 121 - English Composition Credit Hours: 3
Laboratory Science Elective Credit Hours: 4
Social Science Elective Credit Hours: 3
Total: 13 Credit Hours

Winter
PSY 202 - Psychology Credit Hours: 3
WRI 122 - Argumentative Writing Credit Hours: 3
Laboratory Science Elective Credit Hours: 4
Social Science Elective Credit Hours: 3
Elective Credit Hours: 3
Total: 16 Credit Hours

Spring
PSY 203 - Psychology Credit Hours: 3
SPE 111 - Public Speaking Credit Hours: 3
Laboratory Science Elective Credit Hours: 4
Social Science Elective Credit Hours: 3
Elective Credit Hours: 3
Total: 16 Credit Hours

Sophomore Year Fall
MATH 111 - College Algebra Credit Hours: 4
PSY 215 - Abnormal Psychology I Credit Hours: 3
SPE 321 - Small Group/Team Comm Credit Hours: 3
Humanities Elective Credit Hours: 3
Social Science Elective Credit Hours: 3
Total: 16 Credit Hours

Winter
MATH 243 - Introductory Statistics Credit Hours: 4
or
MATH 361 - Statistical Methods I Credit Hours: 4
or
PSY 225 - Applied Stats for Social Sci Credit Hours: 4

PSY 216 - Abnormal Psychology II Credit Hours: 3
PSY 311 - Human Growth & Dev I Credit Hours: 3
Communications Elective Credit Hours: 3
Humanities Elective Credit Hours: 3
Total: 16 Credit Hours

Spring
PSY 301 - Basic Counseling Techniques Credit Hours: 4
PSY 312 - Human Growth & Dev II Credit Hours: 3
PSY 313 - Psych Research Methods I Credit Hours: 4
PSY 317 - Field & Career Preparation Credit Hours: 3
Total: 14 Credit Hours

Junior Year Fall
PSY 334 - Behavior Modification I Credit Hours: 4
PSY 339 - Biopsychology Credit Hours: 3
Communication Elective Credit Hours: 3
Electives Credit Hours: 6 [a]
Total: 16 Credit Hours

Winter
PSY 330 - Social Psychology I Credit Hours: 3
PSY 335 - Behavior Modification II Credit Hours: 4
Humanities Elective Credit Hours: 3

Electives Credit Hours: 6 [a]
and/or
Applied Experience Credit Hours: 6 [b]
Total: 16 Credit Hours

Spring
PSY 331 - Social Psychology II Credit Hours: 3
PSY 455 - Cognitive Psychology Credit Hours: 3

Electives Credit Hours: 9 [a]
and/or
Applied Experience Credit Hours: 9 [b]
Total: 15 Credit Hours

Senior Year Fall
PSY 475 - Capstone in Applied Psychology Credit Hours: 3

Electives Credit Hours: 11 [a]
and/or
Applied Experience Credit Hours: 11 [b]
Total: 14 Credit Hours

Winter
Electives Credit Hours: 14 [a]
or
Applied Experience Credit Hours: 14 [b]
Total: 14 Credit Hours

Spring
Electives Credit Hours: 14 [a]
or
Applied Experience Credit Hours: 14 [b]
Total: 14 Credit Hours

Total for a B.S. in Applied Psychology: 180 Credit Hours

Notes: 60 upper-division credits required
[a] Electives – 54 credits
[b] Applied Experience – Student must complete at least 12 credits of the following: PSY 314, PSY 420, PSY 421, PSY 422, PSY 423, PSY 441, PSY 442, PSY 443, PSY 445, and PSY 497

Population Health Management, Applied Health Data Analytics Emphasis, BS

Degree Requirements

Students must meet the general education requirements, as stated elsewhere in this catalog, and satisfactorily complete the courses listed in this curriculum to obtain the Bachelor of Science in Population Health Management. A total of 184 credits are required for the degree. Students must complete a core program; in addition, students must complete an emphasis area (listed below). A total of 18 credits are needed for an emphasis; a minimum of 9 upper division credits are needed. Credits taken for externship or senior project do not count toward the emphasis. Students electing to take externship are restricted to a maximum of 32 credits. All core and emphasis courses must be completed with a minimum grade of "C" in order to earn the degree.

Curriculum

Required courses and recommended terms during which they should be taken:

Freshman Year Fall
HIST 275 - Intro to Hist of Medicine Credit Hours: 3
PHM 105 - Intro to Population Health Management Credit Hours: 3
SOC 204 - Intro to Sociology Credit Hours: 3
WRI 121 - English Composition Credit Hours: 3
Humanities Elective Credit Hours: 3
Total: 15 Credit Hours

Winter
MATH 111 - College Algebra Credit Hours: 4
SOC 201 - Classical Sociol Theory Credit Hours: 3
WRI 122 - Argumentative Writing Credit Hours: 3
Communication Elective Credit Hours: 3
Elective Credit Hours: 3
Total: 16 Credit Hours

Spring
SOC 206 - Social Problems Credit Hours: 3
SOC 225 - Medical Sociology Credit Hours: 3
SPE 111 - Public Speaking Credit Hours: 3
Communication Elective Credit Hours: 3 [a]
Humanities Elective Credit Hours: 3
Total: 15 Credit Hours

Sophomore Year Fall
MIS 255 - Health Informatics Cpts & Prct Credit Hours: 3
PSY 201 - Psychology Credit Hours: 3
SOC 205 - Current Health Issues Credit Hours: 3
Laboratory Science Elective Credit Hours: 4
Communication Elective Credit Hours: 3
Total: 16 Credit Hours

Winter
MATH 243 - Introductory Statistics Credit Hours: 4

PSY 202 - Psychology Credit Hours: 3
or
PSY 203 - Psychology Credit Hours: 3

SOC 202 - Contemporary Soc Theory Credit Hours: 3
Elective Credit Hours: 3
Laboratory Science Elective Credit Hours: 4
Total: 17 Credit Hours

Spring
MATH 361 - Statistical Methods I Credit Hours: 4
MIS 275 - Intro to Relational Databases Credit Hours: 4
SOC 305 - Rural Health Credit Hours: 3
Laboratory Science Elective Credit Hours: 4
Total: 15 Credit Hours

Junior Year Fall
BUS 313 - Health Care Systems & Policy Credit Hours: 3
GIS 103 - The Digital Earth Credit Hours: 3
SOC 301 - Soc Science Research Methods Credit Hours: 4
SOC 325 - Global Population Health Credit Hours: 3
Total: 13 Credit Hours

Winter
GIS 134 - Geographic Info Systems Credit Hours: 3
PHM 345 - Community Health Grant Writing Credit Hours: 3
PHM 435 - Research Center Credit Hours: 3
SOC 302 - Soc Science Resrch Methods II Credit Hours: 4
STAT 414 - Stat Methods in Epidemiology Credit Hours: 4
Total: 17 Credit Hours

Spring
PHIL 305 - Medical Ethics Credit Hours: 3
PHM 321 - Community Program Planning Credit Hours: 3
PHM 435 - Research Center Credit Hours: 3
SOC 335 - Hlth Inequal & Cult Competency Credit Hours: 3
Emphasis Elective Credit Hours: 3 [a]
Total: 15 Credit Hours

Senior Year Fall
Externship Credit Hours: 15 [c]
or
Emphasis Electives Credit Hours: 15 [a]
Total: 15 Credit Hours

Winter
Externship Credit Hours: 15 [c]
or
Emphasis Electives Credit Hours: 15 [a]
Total: 15 Credit Hours

Spring
Externship Credit Hours: 15 [c]
or
Emphasis Electives Credit Hours: 15 [a]
Total: 15 Credit Hours

Total for a B.S. in Population Health Management: 184 Credit Hours

[a] See advisor or consult emphasis elective list above for appropriate courses
[b] To complete an emphasis, students must take courses from the appropriate list that follows. Credits taken for externship or senior project do not count as emphasis electives. A total of 18 credits are needed for an emphasis; a minimum of 9 upper division credits are needed
[c] Externship site and/or senior projects are coordinated in SOC 421. No more than 32 credits of externship allowed for graduation without departmental approval

Emphasis Requirements

Students completing the Applied Health Data Analytics emphasis must complete the following courses:

BUS 316 - Total Quality Health Care Credit Hours: 3
MATH 362 - Statistical Methods II Credit Hours: 4
MATH 465 - Mathematical Statistics Credit Hours: 4
MIS 344 - Business Intelligence Credit Hours: 3
MIS 357 - Info & Comm Systs in Hlth Care Credit Hours: 3
MIS 445 - Legal/Eth/Soc Iss in HC Tech Credit Hours: 3
PSY 339 - Biopsychology Credit Hours: 3
SOC 405 - Program Planning & Eval Credit Hours: 3
WRI 123 - Research Writing Credit Hours: 3
WRI 227 - Technical Report Writing Credit Hours: 3
WRI 410 - Proposal & Grant Writing Credit Hours: 3

Population Health Management, BS

Degree Requirements

Students must meet the general education requirements, as stated elsewhere in this catalog, and satisfactorily complete the courses listed in this curriculum to obtain the Bachelor of Science in Population Health Management. A total of 184 credits are required for the degree. Students must complete a core program; in addition, students must complete an emphasis area (listed below). A total of 18 credits are needed for an emphasis; a minimum of 9 upper division credits are needed. Credits taken for externship or senior project do not count toward the emphasis. Students electing to take externship are restricted to a maximum of 32 credits. All core and emphasis courses must be completed with a minimum grade of "C" in order to earn the degree.

Curriculum

Required courses and recommended terms during which they should be taken:

Freshman Year Fall
HIST 275 - Intro to Hist of Medicine Credit Hours: 3
PHM 105 - Intro to Population Health Management Credit Hours: 3
SOC 204 - Intro to Sociology Credit Hours: 3
WRI 121 - English Composition Credit Hours: 3
Humanities Elective Credit Hours: 3
Total: 15 Credit Hours

Winter
MATH 111 - College Algebra Credit Hours: 4
SOC 201 - Classical Sociol Theory Credit Hours: 3
WRI 122 - Argumentative Writing Credit Hours: 3
Communication Elective Credit Hours: 3
Elective Credit Hours: 3
Total: 16 Credit Hours

Spring
SOC 206 - Social Problems Credit Hours: 3
SOC 225 - Medical Sociology Credit Hours: 3
SPE 111 - Public Speaking Credit Hours: 3
Communication Elective Credit Hours: 3 [a]
Humanities Elective Credit Hours: 3
Total: 15 Credit Hours

Sophomore Year Fall
MIS 255 - Health Informatics Cpts & Prct Credit Hours: 3
PSY 201 - Psychology Credit Hours: 3
SOC 205 - Current Health Issues Credit Hours: 3
Laboratory Science Elective Credit Hours: 4
Communication Elective Credit Hours: 3
Total: 16 Credit Hours

Winter
MATH 243 - Introductory Statistics Credit Hours: 4

PSY 202 - Psychology Credit Hours: 3
or
PSY 203 - Psychology Credit Hours: 3

SOC 202 - Contemporary Soc Theory Credit Hours: 3
Elective Credit Hours: 3
Laboratory Science Elective Credit Hours: 4
Total: 17 Credit Hours

Spring
MATH 361 - Statistical Methods I Credit Hours: 4
MIS 275 - Intro to Relational Databases Credit Hours: 4
SOC 305 - Rural Health Credit Hours: 3
Laboratory Science Elective Credit Hours: 4
Total: 14 Credit Hours

Junior Year Fall
BUS 313 - Health Care Systems & Policy Credit Hours: 3
GIS 103 - The Digital Earth Credit Hours: 3
SOC 301 - Soc Science Research Methods Credit Hours: 4
SOC 325 - Global Population Health Credit Hours: 3
Total: 13 Credit Hours

Winter
GIS 134 - Geographic Info Systems Credit Hours: 3
PHM 345 - Community Health Grant Writing Credit Hours: 3
PHM 435 - Research Center Credit Hours: 3
SOC 302 - Soc Science Resrch Methods II Credit Hours: 4
STAT 414 - Stat Methods in Epidemiology Credit Hours: 4
Total: 17 Credit Hours

Spring
PHIL 305 - Medical Ethics Credit Hours: 3
PHM 321 - Community Program Planning Credit Hours: 3
PHM 435 - Research Center Credit Hours: 3
SOC 335 - Hlth Inequal & Cult Competency Credit Hours: 3
Emphasis Elective Credit Hours: 3 [a]
Total: 15 Credit Hours

Senior Year Fall
Externship Credit Hours: 15 [c]
or
Emphasis Electives Credit Hours: 15 [a]
Total: 15 Credit Hours

Winter
Externship Credit Hours: 15 [c]
or
Emphasis Electives Credit Hours: 15 [a]
Total: 15 Credit Hours

Spring
Externship Credit Hours: 15 [c]
or
Emphasis Electives Credit Hours: 15 [a]
Total: 15 Credit Hours

Total for a B.S. in Population Health Management: 184 Credit Hours

[a] See advisor
[b] To complete an emphasis, students must take courses from the appropriate list that follows. Credits taken for externship or senior project do not count as emphasis electives. A total of 18 credits are needed for an emphasis; a minimum of 9 upper division credits are needed
[c] Externship site and/or senior projects are coordinated in SOC 421. No more than 32 credits of externship allowed for graduation without departmental approval

Population Health Management, Care Coordination/Pre-Health Professions Emphasis, BS

Degree Requirements

Students must meet the general education requirements, as stated elsewhere in this catalog, and satisfactorily complete the courses listed in this curriculum to obtain the Bachelor of Science in Population Health Management. A total of 184 credits are required for the degree. Students must complete a core program; in addition, students must complete an emphasis area (listed below). A total of 18 credits are needed for an emphasis; a minimum of 9 upper division credits are needed. Credits taken for externship or senior project do not count toward the emphasis. Students electing to take externship are restricted to a maximum of 32 credits. All core and emphasis courses must be completed with a minimum grade of "C" in order to earn the degree.

Curriculum

Required courses and recommended terms during which they should be taken:

Freshman Year Fall
HIST 275 - Intro to Hist of Medicine Credit Hours: 3
PHM 105 - Intro to Population Health Management Credit Hours: 3
SOC 204 - Intro to Sociology Credit Hours: 3
WRI 121 - English Composition Credit Hours: 3
Humanities Elective Credit Hours: 3
Total: 15 Credit Hours

Winter
MATH 111 - College Algebra Credit Hours: 4
SOC 201 - Classical Sociol Theory Credit Hours: 3
WRI 122 - Argumentative Writing Credit Hours: 3
Communication Elective Credit Hours: 3
Elective Credit Hours: 3
Total: 16 Credit Hours

Spring
SOC 206 - Social Problems Credit Hours: 3
SOC 225 - Medical Sociology Credit Hours: 3
SPE 111 - Public Speaking Credit Hours: 3
Communication Elective Credit Hours: 3 [a]
Humanities Elective Credit Hours: 3
Total: 15 Credit Hours

Sophomore Year Fall
MIS 255 - Health Informatics Cpts & Prct Credit Hours: 3
PSY 201 - Psychology Credit Hours: 3
SOC 205 - Current Health Issues Credit Hours: 3
Laboratory Science Elective Credit Hours: 4
Communication Elective Credit Hours: 3
Total: 16 Credit Hours

Winter
MATH 243 - Introductory Statistics Credit Hours: 4

PSY 202 - Psychology Credit Hours: 3
or
PSY 203 - Psychology Credit Hours: 3

SOC 202 - Contemporary Soc Theory Credit Hours: 3
Elective Credit Hours: 3
Laboratory Science Elective Credit Hours: 4
Total: 17 Credit Hours

Spring
MATH 361 - Statistical Methods I Credit Hours: 4
MIS 275 - Intro to Relational Databases Credit Hours: 4
SOC 305 - Rural Health Credit Hours: 3
Laboratory Science Elective Credit Hours: 4
Total: 15 Credit Hours

Junior Year Fall
BUS 313 - Health Care Systems & Policy Credit Hours: 3
GIS 103 - The Digital Earth Credit Hours: 3
SOC 301 - Soc Science Research Methods Credit Hours: 4
SOC 325 - Global Population Health Credit Hours: 3
Total: 13 Credit Hours

Winter
GIS 134 - Geographic Info Systems Credit Hours: 3
PHM 345 - Community Health Grant Writing Credit Hours: 3
PHM 435 - Research Center Credit Hours: 3
SOC 302 - Soc Science Resrch Methods II Credit Hours: 4
STAT 414 - Stat Methods in Epidemiology Credit Hours: 4
Total: 17 Credit Hours

Spring
PHIL 305 - Medical Ethics Credit Hours: 3
PHM 321 - Community Program Planning Credit Hours: 3
PHM 435 - Research Center Credit Hours: 3
SOC 335 - Hlth Inequal & Cult Competency Credit Hours: 3
Emphasis Elective Credit Hours: 3 [a]
Total: 15 Credit Hours

Senior Year Fall
Externship Credit Hours: 15 [c]
or
Emphasis Electives Credit Hours: 15 [a]
Total: 15 Credit Hours

Winter
Externship Credit Hours: 15 [c]
or
Emphasis Electives Credit Hours: 15 [a]
Total: 15 Credit Hours

Spring
Externship Credit Hours: 15 [c]
or
Emphasis Electives Credit Hours: 15 [a]
Total: 15 Credit Hours

Total for a B.S. in Population Health Management: 184 Credit Hours

[a] See advisor or consult emphasis elective list above for appropriate courses
[b] To complete an emphasis, students must take courses from the appropriate list that follows. Credits taken for externship or senior project do not count as emphasis electives. A total of 18 credits are needed for an emphasis; a minimum of 9 upper division credits are needed
[c] Externship site and/or senior projects are coordinated in SOC 421. No more than 32 credits of externship allowed for graduation without departmental approval

Emphasis Requirements

Students completing the Care Coordination/Pre-Health Professions emphasis must complete the following courses:

ANTH 103 - Intro to Cultural Anthropology Credit Hours: 3
BIO 200 - Medical Terminology Credit Hours: 2
BIO 231 - Human Anatomy/Physiology I Credit Hours: 4
BIO 232 - Human Anatomy/Physiology II Credit Hours: 4
BIO 233 - Human Anatomy/Physiology III Credit Hours: 4
BUS 313 - Health Care Systems & Policy Credit Hours: 3
BUS 316 - Total Quality Health Care Credit Hours: 3
COM 205 - Intercultural Comm Credit Hours: 3
COM 345 - Organization Comm I Credit Hours: 3
PSY 347 - Organizational Behavior Credit Hours: 3
PSY 360 - Organizational Psych Credit Hours: 3
PSY 410 - Organiz Change/Develop Credit Hours: 3
SOC 305 - Rural Health Credit Hours: 3
SOC 315 - Juvenile Delinquency Credit Hours: 3
SOC 405 - Program Planning & Eval Credit Hours: 3

Population Health Management, Health Promotion Emphasis, BS

Degree Requirements

Students must meet the general education requirements, as stated elsewhere in this catalog, and satisfactorily complete the courses listed in this curriculum to obtain the Bachelor of Science in Population Health Management. A total of 184 credits are required for the degree. Students must complete a core program; in addition, students must complete an emphasis area (listed below). A total of 18 credits are needed for an emphasis; a minimum of 9 upper division credits are needed. Credits taken for externship or senior project do not count toward the emphasis. Students electing to take externship are restricted to a maximum of 32 credits. All core and emphasis courses must be completed with a minimum grade of "C" in order to earn the degree.

Curriculum

Required courses and recommended terms during which they should be taken:

Freshman Year Fall
HIST 275 - Intro to Hist of Medicine Credit Hours: 3
PHM 105 - Intro to Population Health Management Credit Hours: 3
SOC 204 - Intro to Sociology Credit Hours: 3
WRI 121 - English Composition Credit Hours: 3
Humanities Elective Credit Hours: 3
Total: 15 Credit Hours

Winter
MATH 111 - College Algebra Credit Hours: 4
SOC 201 - Classical Sociol Theory Credit Hours: 3
WRI 122 - Argumentative Writing Credit Hours: 3
Communication Elective Credit Hours: 3
Elective Credit Hours: 3
Total: 16 Credit Hours

Spring
SOC 206 - Social Problems Credit Hours: 3
SOC 225 - Medical Sociology Credit Hours: 3
SPE 111 - Public Speaking Credit Hours: 3
Communication Elective Credit Hours: 3 [a]
Humanities Elective Credit Hours: 3
Total: 15 Credit Hours

Sophomore Year Fall
MIS 255 - Health Informatics Cpts & Prct Credit Hours: 3
PSY 201 - Psychology Credit Hours: 3
SOC 205 - Current Health Issues Credit Hours: 3
Laboratory Science Elective Credit Hours: 4
Communication Elective Credit Hours: 3
Total: 16 Credit Hours

Winter
MATH 243 - Introductory Statistics Credit Hours: 4

PSY 202 - Psychology Credit Hours: 3
or
PSY 203 - Psychology Credit Hours: 3

SOC 202 - Contemporary Soc Theory Credit Hours: 3
Elective Credit Hours: 3
Laboratory Science Elective Credit Hours: 4
Total: 17 Credit Hours

Spring
MATH 361 - Statistical Methods I Credit Hours: 4
MIS 275 - Intro to Relational Databases Credit Hours: 4
SOC 305 - Rural Health Credit Hours: 3
Laboratory Science Elective Credit Hours: 4
Total: 14 Credit Hours

Junior Year Fall
BUS 313 - Health Care Systems & Policy Credit Hours: 3
GIS 103 - The Digital Earth Credit Hours: 3
SOC 301 - Soc Science Research Methods Credit Hours: 4
SOC 325 - Global Population Health Credit Hours: 3
Total: 13 Credit Hours

Winter
GIS 134 - Geographic Info Systems Credit Hours: 3
PHM 345 - Community Health Grant Writing Credit Hours: 3
PHM 435 - Research Center Credit Hours: 3
SOC 302 - Soc Science Resrch Methods II Credit Hours: 4
STAT 414 - Stat Methods in Epidemiology Credit Hours: 4
Total: 17 Credit Hours

Spring
PHIL 305 - Medical Ethics Credit Hours: 3
PHM 321 - Community Program Planning Credit Hours: 3
PHM 435 - Research Center Credit Hours: 3
SOC 335 - Hlth Inequal & Cult Competency Credit Hours: 3
Emphasis Elective Credit Hours: 3 [a]
Total: 15 Credit Hours

Senior Year Fall
Externship Credit Hours: 15 [c]
or
Emphasis Electives Credit Hours: 15 [a]
Total: 15 Credit Hours

Winter
Externship Credit Hours: 15 [c]
or
Emphasis Electives Credit Hours: 15 [a]
Total: 15 Credit Hours

Spring
Externship Credit Hours: 15 [c]
or
Emphasis Electives Credit Hours: 15 [a]
Total: 15 Credit Hours

Total for a B.S. in Population Health Management: 184 Credit Hours

[a] See advisor or consult emphasis elective list above for appropriate courses
[b] To complete an emphasis, students must take courses from the appropriate list that follows. Credits taken for externship or senior project do not count as emphasis electives. A total of 18 credits are needed for an emphasis; a minimum of 9 upper division credits are needed
[c] Externship site and/or senior projects are coordinated in SOC 421. No more than 32 credits of externship allowed for graduation without departmental approval

Emphasis Requirements

Students completing the Health Promotion emphasis must complete the following courses:
COM 205 - Intercultural Comm Credit Hours: 3
COM 336 - Nonverbal Communication Credit Hours: 3
PSY 215 - Abnormal Psychology I Credit Hours: 3
PSY 216 - Abnormal Psychology II Credit Hours: 3
PSY 220 - Community Psych Credit Hours: 3
PSY 301 - Basic Counseling Techniques Credit Hours: 4
PSY 330 - Social Psychology I Credit Hours: 3
PSY 331 - Social Psychology II Credit Hours: 3
PSY 334 - Behavior Modification I Credit Hours: 4
PSY 335 - Behavior Modification II Credit Hours: 4
PSY 341 - Psychoactive Drugs I Credit Hours: 3
PSY 342 - Psychoactive DrugsII: Abused Credit Hours: 3
SOC 305 - Rural Health Credit Hours: 3
SOC 315 - Juvenile Delinquency Credit Hours: 3
SOC 405 - Program Planning & Eval Credit Hours: 3

Arts, Literature, and Philosophy (ALPs) Minor

The ALPs minor may be completed by students from any major and is especially recommended to students who want an opportunity to take a secondary focus in the Humanities during their time at Oregon Tech. This secondary focus will give them an opportunity to further explore their passions in the fields of Arts, Literature, and Philosophy while receiving official recognition of their newly-acquired expertise. The minor will give students the ability to take more Humanities classes that are relevant to their major program and their future career goals while instilling in them the knowledge and values associated with a traditional liberal arts education.

The minor requires 18 credit hours, including one of the required courses listed below (3 credits). The remaining courses must be chosen from the following prefixes: ART, HUM, LIT, PHIL. At least 12 of these 15 credit hours must be upper division courses. Transfer students must take at least 9 hours of their minor credits at Oregon Tech to qualify.

Requirements of the Minor

Required Course

(3 credits, one from this set is required, but others can be counted toward electives, below):
HUM 105 - EAC: Text, Images, Games Credit Hours: 3
HUM 125 - Intro Tech, Soc, Value Credit Hours: 3
HUM 147 - West Cult in the Classical Age Credit Hours: 3 (f/k/a Introduction to Humanities I)
HUM 148 - West Cult in the Medieval Age Credit Hours: 3 (f/k/a Introduction to Humanities II)
HUM 149 - West Cult in the Modern Age Credit Hours: 3 (f/k/a Introduction to Humanities III)
LIT 253 - 19th Century American Lit Credit Hours: 3 (f/k/a American Literature I)
LIT 254 - 20th Century American Lit Credit Hours: 3 (f/k/a American Literature II)
LIT 255 - Contemporary American Lit Credit Hours: 3 (f/k/a American Literature III)
PHIL 105 - Introduction to Ethics Credit Hours: 3
PHIL 205 - Introduction to Logic Credit Hours: 3

Electives

(15 credits, at least 12 upper division):
ART 205 - Introduction to Watercolors Credit Hours: 3
ART 210 - Beginning Sculpture Credit Hours: 3
ART 220 - Basic Drawing Credit Hours: 3
ART 226 - Digital Photography Credit Hours: 3
ART 280 - Introductory Painting Credit Hours: 3
ART 282 - Intro to Acrylic Painting Credit Hours: 3
HUM 105 - EAC: Text, Images, Games Credit Hours: 3
HUM 125 - Intro Tech, Soc, Value Credit Hours: 3
HUM 147 - West Cult in the Classical Age Credit Hours: 3 (f/k/a Introduction to Humanities I)
HUM 148 - West Cult in the Medieval Age Credit Hours: 3 (f/k/a Introduction to Humanities II)
HUM 149 - West Cult in the Modern Age Credit Hours: 3 (f/k/a Introduction to Humanities III)
HUM 235 - Introduction to Film Credit Hours: 4
HUM 345 - Digital Culture and Society Credit Hours: 3
HUM 335 - Video Game Studies Credit Hours: 3
LIT 104 - Intro to Literature Credit Hours: 3
LIT 105 - Intro to Literature Credit Hours: 3
LIT 106 - Intro to Literature Credit Hours: 3
HUM 225 - Cont Thter: Ashland Plays Credit Hours: 3
LIT 235 - American Multicultural Lit Credit Hours: 3
LIT 253 - 19th Century American Lit Credit Hours: 3 (f/k/a American Literature I)
LIT 254 - 20th Century American Lit Credit Hours: 3 (f/k/a American Literature II)
LIT 255 - Contemporary American Lit Credit Hours: 3 (f/k/a American Literature III)
LIT 266 - Native American Lit & Film Credit Hours: 3
LIT 305 - Ecol Issues in Nature Writing Credit Hours: 3
LIT 315 - Science Fiction Lit & Flim Credit Hours: 3
LIT 325 - The Metropolis Credit Hours: 3
LIT 335 - Travel Lit: Fiction & Nonfict Credit Hours: 3
LIT 345 - Postapocalyptic Lit & Film Credit Hours: 3
LIT 367 - Art & Trash in Contemp Fiction Credit Hours: 3
LIT 373 - British Culture & Literature Credit Hours: 3
LIT 381 - Contemporary World Lit Credit Hours: 3
LIT 456 - Topics in Film Credit Hours: 3
PHIL 105 - Introduction to Ethics Credit Hours: 3
PHIL 205 - Introduction to Logic Credit Hours: 3
PHIL 215 - Ethical Theory Credit Hours: 3
PHIL 305 - Medical Ethics Credit Hours: 3
PHIL 315 - The Ethics of Emerging Tech Credit Hours: 3
PHIL 325 - Environmental Ethics Credit Hours: 3
PHIL 331 - Ethics in the Professions Credit Hours: 3
PHIL 335 - Philosophy of Science Credit Hours: 3
PHIL 342 - Business Ethics Credit Hours: 3
PHIL 405 - Advanced Logic Credit Hours: 3

Medical Sociology Minor

The Department of Humanities and Social Sciences offers a Medical Sociology Minor as a supplement to the Oregon Tech technical and applied degrees related to health, health care, management and social science. The minor offers courses covering the central topics of medical sociology, including the social factors in health and illness, the patient experience of illness, the role of health care professionals, and the interaction between health and society. The Medical Sociology Minor is designed with the current employer demands and changes in health care organization in mind. Many employers within the health care field seek employees who are culturally competent, prepared to work with diverse populations, and are familiar with social determinants of health.

A minimum of 20 or 21 credits is required to complete the minor. Enrollment in the minor is through the Humanities and Social Sciences Department; contact the department chair or your advisor for more information.

Required Courses

SOC 204 - Intro to Sociology Credit Hours: 3 [a]
SOC 225 - Medical Sociology Credit Hours: 3
SOC 325 - Global Population Health Credit Hours: 3
SOC 335 - Hlth Inequal & Cult Competency Credit Hours: 3

Choose three courses from the following:
Two of the three courses must be 300 or 400 level.
BIO 200 - Medical Terminology Credit Hours: 2
BUS 316 - Total Quality Health Care Credit Hours: 3
COM 225 - Interpers Communication Credit Hours: 3
COM 345 - Organization Comm I Credit Hours: 3
COM 346 - Health Communication Credit Hours: 3
HIST 275 - Intro to Hist of Medicine Credit Hours: 3
PHIL 305 - Medical Ethics Credit Hours: 3
PSY 202 - Psychology Credit Hours: 3
PSY 330 - Social Psychology I Credit Hours: 3
PSY 336 - Health Psychology I Credit Hours: 3
PSY 371 - Human Sexuality I Credit Hours: 3
PSY 372 - Human Sexuality II Credit Hours: 3
SOC 305 - Rural Health Credit Hours: 3
STAT 414 - Stat Methods in Epidemiology Credit Hours: 4

SOC 307 - Seminar Credit Hours: 15 will be considered as electives pending program director approval.
SOC 407 - Seminar Credit Hours: 12 will be considered as electives pending program director approval.
or
PSY 307 - Seminar Credit Hours: 6 will be considered as electives pending program director approval.
PSY 407 - Seminar Credit Hours: 12 will be considered as electives pending program director approval.

[a] Students are required to take SOC 204 before taking SOC 225

Psychology Minor

The psychology minor is open to all majors and is especially recommended for students majoring in allied health and medical sciences, management, and communication studies. The minor offers a variety of courses in psychology that can enhance knowledge. A minimum of 24 credits is required to complete the minor. Students should meet with a psychology advisor when choosing electives to fulfill the minor requirements. Enrollment in the minor is through the Humanities and Social Sciences Department; contact the department chair or your advisor for more information.

Requirements of the Minor

A minimum of 24 credits is required to earn the minor.
A minimum of 12 credits must be selected from upper-division coursework. Students must pay strict attention to prerequisite requirements.

Courses Required lower division courses (9 credits):
PSY 201 - Psychology
PSY 202 - Psychology
PSY 203 – Psychology

Additional Courses:
12 credits of upper division psychology courses
3 credits of lower or upper division courses

For all courses counted toward the Minor in Psychology, a letter grade of "C" or better is required to be awarded the minor.
At least 12 credits of courses in this minor must be completed at Oregon Tech.

Note: Not all courses are offered every term or every year.

Applied Behavior Analysis Graduate Certificate

The Certificate in Applied Behavior Analysis is a 27-credit, nine-course sequence for individuals who wish to pursue additional coursework in Applied Behavior Analysis. The Behavior Analyst Certification Board, Inc.® has approved this course sequence as meeting the course work requirements for eligibility to take the Board Certified Behavior Analyst® exam (applicants for the BCBA® exam will have to meet additional requirements to qualify).

Required Courses (27 Credits)

ABA 511 - Foundations of ABA I Credit Hours: 3
ABA 512 - Foundations of ABA II Credit Hours: 3
ABA 521 - Ethics & Professional Issues I Credit Hours: 3
ABA 522 - Ethics & Profess Issues II Credit Hours: 3
ABA 525 - Research Methods in ABA Credit Hours: 3
ABA 526 - Behavioral Assessment Credit Hours: 3
ABA 531 - Behavioral Change I Credit Hours: 3
ABA 532 - Behavioral Change II Credit Hours: 3
ABA 535 - Special Topics in ABA Credit Hours: 3

Medical Imaging Technology Department

Debbie McCollam, *Department Chair*
Robyn Cole, *Diagnostic Medical Sonography Program Director*
Barry Canaday, *Echocardiography Clinical Coordinator*
Don McDonnell, *Radiologic Science Program Director*
Chris Caster, *Vascular Technology Program Director*
Richard Hoylman, *Nuclear Medicine and Molecular Imaging Technology Program Director and Clinical Coordinator*
Tara Guthrie, *Echocardiography Program Director*
Wendy Rogers, *Radiologic Science Clinical Coordinator*
Bobbi Kowash, *Diagnostic Medical Sonography Clinical Coordinator*
Leah Jolly, *Vascular Technology Clinical Coordinator*
Janette Isaacson, *Program Director Vascular Technology and Echocardiography Degree Completion & Masters of Science in Allied Health*
Gary Zimmerman, *Radiologic Science Degree Completion Program Director*
Robyn Cole, *Diagnostic Medical Sonography Degree Completion Program Director*
Vanessa Bennett, *Nuclear Medicine Clinical Coordinator, and Scheduling Coordinator*
Professors: R. Cole, R. Hoylman, D. McCollam, T. McVay, S. Schultz, G. Zimmerman
Associate Professors: B. Canaday, C. Caster, D. McDonnell
Assistant Professors: V. Bennett, M. Breedlove, R. Carson, T. Guthrie, B. Kowash
Instructors: L. Jolly, L. Steinbock, W. Rogers
Participating Faculty: J. Isaacson, Associate Professor (Online Education)
Participating Faculty: J. Steenport (Online PACs)

Degrees Offered

- Master of Science in Allied Health
- Bachelor of Science in Diagnostic Medical Sonography
- Bachelor of Science in Echocardiography
- Bachelor of Science in Nuclear Medicine and Molecular Imaging Technology
- Bachelor of Science in Radiologic Science
- Bachelor of Science in Vascular Technology

Certificates Offered

- Magnetic Resonance Imaging
- Picture Archiving and Communication Systems (PACS)

Department Objectives

The objectives of the Medical Imaging Technology Department are:

1. To prepare students to become effective participants in the medical imaging professions.
2. To provide the residents of Oregon and the Pacific Northwest with Bachelor of Science degrees in Medical Imaging Technology.
3. To prepare students for professions that require critical-thinking and problem solving skills.
4. To instill an effective influence of professional character, the knowledge and experience to pass the National Registry exams.
5. To instill lifelong learning.

Accreditation

Oregon Institute of Technology is accredited by Northwest Commission on Colleges and Universities, 8060 165th Ave. NE, Suite 100, Redmond, WA 98052-3981, an institutional accrediting body recognized by the Council for Higher Education Accreditation and/or the Secretary of the U.S. Department of Education.

The Diagnostic Medical Sonography, Echocardiography and Vascular Technology programs are programmatically accredited through the Commission on Accreditation of Allied Health Education Programs (CAAHEP), upon review of the Joint Review Committee on Education in Diagnostic Medical Sonography (JRC-DMS).

Echocardiography - Goal and Mission Statement
To prepare competent entry-level adult cardiac sonographers in the cognitive (knowledge), psychomotor (skills), and affective (behavior) learning domains

Diagnostic Medical Sonography - Goal and Mission Statement
To prepare competent entry-level general sonographers in the cognitive (knowledge), psychomotor (skills), and affective (behavior) learning domains

Vascular Technology - Goal and Mission Statement
To prepare competent entry-level vascular sonographers in the cognitive (knowledge), psychomotor (skills), and affective (behavior) learning domains

Master of Science in Allied Health

The MSAH program supports Oregon Tech's mission to offer rigorous applied degree programs by providing scholarly, research and evidence based, high quality coursework (aligned with the National Center for Healthcare Leadership guidelines) ensuring student success in the work place.

The discipline of allied health leadership in health care settings involves effective communication, building relationships, self-confidence, self-development, team leadership, change leadership, accountability, collaboration, organizational development, performance measurements, financial skills, innovative thinking and strategic orientation. The MSAH curriculum emphasizes strong foundational course work and hands-on application through real life health care cases to prepare students to be effective professionals in their communities. Typical students in the program are already employed and are

working to advance their degrees and career opportunities in leadership, management, and administration of public health systems, health care systems, hospitals, and hospital networks.

Bachelor of Science Program Descriptions

The Department of Medical Imaging Technology offers bachelor's degrees in five professional programs, which encompass the spectrum of imaging sciences. The curriculum of each bachelor's degree program provides the technical, scientific, and communication skills essential for the application of learned concepts. Each program prepares students for immediate employment and for successfully passing the national and state registry examinations in each field.

Diagnostic Medical Sonography (also called sonography, ultrasound, or general ultrasound)
Sonography uses high frequency sound wave imaging and Doppler instrumentation to aid in the diagnosis of pathology and disease processes. The sonographer gathers pertinent patient history, creates images, and submits preliminary findings to the reading physician. Common exams include: obstetric, gynecological, peritoneal, retroperitoneal, pelvic, thoracic, musculoskeletal, extremity, neurological, and superficial procedures. Invasive applications are also performed in most clinical settings.

Echocardiography
Echocardiography is a safe method of obtaining ultrasound images for diagnosis of cardiac pathology in adult and pediatric patient populations. Echocardiographers perform imaging exams that include acquisition of detailed images of heart anatomy, evaluation of pathologies, and measurement/analysis of hemodynamic flow patterns within the heart and the heart's major vessels. The Echocardiographer prepares the study images and reports pertinent findings to the interpreting cardiologist as part of the diagnostic process.

Nuclear Medicine and Molecular Imaging Technology
Nuclear Medicine and Molecular Imaging Technology is an imaging science that demonstrates pathology through physiologic processes using radioactive compounds. Sometimes these data are fused with anatomical data such as Computed Tomography (CT) and Magnetic Resonance Imaging (MRI). This branch of imaging science has been in existence for over four decades. This training also prepares the future Nuclear Medicine Technologist with skills in CT, MRI, PET/ CT, and Spect/CT.

Radiologic Science
This program has been in existence at Oregon Tech for more than 50 years. The training prepares the future radiologic technologist with a wide variety of skills, including radiography, fluoroscopy, mobile and surgical radiography, Computed Tomography (CT), Magnetic Resonance Imaging (MRI), Mammography, Cardiovascular Interventional Technology (CIT), Quality Assurance, and imaging department management.

Vascular Technology
Vascular technology is a profession which utilizes ultrasound, Doppler, color Doppler and various physiologic testing procedures to aid in the diagnosis of disease of the vascular system. Vascular technologists conduct patient interviews, compile health histories and determine risk assessments pertaining to vascular disease. The technologists choose appropriate testing modalities and provide referring physicians with preliminary interpretation of results.

Master of Science Program Description

The Department of Medical Imaging Technology offers a Master of Science in Allied Health, which is fully an online degree for students who hold a Bachelor's degree and are working in a health care setting. The program will focus on preparing allied health professionals for advancement in management, education and administration in their respective health care disciplines.

Facilities

Oregon Tech's state-of-the-art imaging equipment allows medical imaging students to become familiar with a wide variety of imaging procedures like those performed in most medical centers. Students may also spend significant time at Sky Lakes Medical Center where they will gain experience directly with patients, prior to externship. This experience plus the academic coursework prepares the student well for the medical imaging professions.

Externships

All five of the bachelor's degree programs in medical imaging culminate in a senior year of clinical externship at a medical center. The 11-month externship is spent at the affiliate institution under the supervision of a clinical instructor. Students do not have classes on the Oregon Tech campus during this year. The location of externship will be determined by a lottery conducted by medical imaging faculty. All students will be guaranteed an externship subject to the following:

1. All academic requirements must be met before externship assignments will be made.
2. Students must satisfy Oregon requirements for clinical placement as listed in Oregon Administrative Rules (OAR 409-030-0100 to 409-030-0250).

Upon successful completion of the externship year, imaging students will be eligible to sit for the professional registry pertaining to their degree.

Admission Requirements

Pre-Medical Imaging Technology: Freshman Year

Enrollment is open to all students who meet the general entry requirements to the university. Students will be listed as Pre-Medical Imaging Technology (Pre-MIT) students. Admittance to the Oregon Tech Pre-MIT Program does not mean the student has been accepted into a specific MIT program.

Program Selection Criteria

Selection criteria are available on the MIT website at www.oit.edu/mit. Students must complete all the courses, including general education, in the specified freshman year (pre-medical imaging) curriculum. Selection will be made at the end of the spring term of the pre-medical imaging technology year. The number of students selected each year will be determined by the number of qualified applicants, and by the availability of clinical sites. Therefore, the number of qualified applicants may exceed the number of spaces available. Prior acceptance does not guarantee future acceptance into any MIT Program. Students must reapply yearly.

Selection will be based upon the following criteria and point system:

1. **GPA:** Students must have a total of a 2.95 **weighted** GPA (though a 3.0 or higher is highly recommended), in the following courses (or equivalent transfer courses) to apply to one of the five MIT Programs.
    - BIO 200 - Medical Terminology
    - BIO 231 - Human Anatomy/Physiology I
    - BIO 232 - Human Anatomy/Physiology II
    - BIO 233 - Human Anatomy/Physiology III
    - CHE 101 - Intro to General Chemistry
    - CHE 104 - Intro to General Chemistry Lab
    - MATH 112 - Trigonometry
    - MIT 103 - Intro to Med Imaging
      GPA points are calculated as GPA x 10. (For example, a 3.5 GPA x 10 = 35). To determine how to calculate weighted GPA, see website at www.oit.edu/mit.
2. All applicants must attend an Oregon Tech hosted selection event at the end of spring term. Several activities are conducted during this event to allow students to demonstrate communication skills, and professionalism. Faculty from the MIT Department and industry leaders are present at the selection event to evaluate those skills.

Application Requirements

Applications are available on the MIT website at www.oit.edu/mit.

Applications are due spring term. Incomplete applications will not be accepted. An application fee of $75 is required. There are no refunds of the application fee. Repeat applicants must follow the same procedures as first-time applicants.

The application form allows ranking of programs by choice (first and second) and only one application per student will be accepted. If multiple applications are received, they will be returned along with the application fees.

Transfer Students

Transfer students who meet the academic requirements of the pre-medical imaging technology year, will not find a course at another college which substitutes for MIT 103 - Intro to Med Imaging. This course may be taken as a distance learning course. It must be completed in the summer, fall, winter or spring term prior to the application to a professional program. The MIT application is available at www.oit.edu/mit. Transfer students must apply to both Oregon Tech and MIT using two separate application processes.

Graduation Requirements

All credits listed in the curriculum for the catalog year a student begins a program must be fulfilled.

Students must maintain a 2.00 GPA to be eligible for graduation. In addition, a final grade of "C" or better must be earned in all professional courses (DMS, ECHO, NMT, RDSC, VAS), and science/mathematics courses to continue in the program. A final grade of "C" or better must be also earned in all required communications courses by the end of the junior year to continue on in the program. Once the student is admitted into a professional program as a sophomore, all curricular requirements must be met within four academic years. Rare exceptions to the time limitation will be considered on a case by case basis, at the discretion of the re-admittance committee described below. When a student unsuccessfully attempts a programmatic course fall term, sophomore year, they must reapply to the program or another imaging program. If the student has an unsuccessful attempt subsequent to fall term sophomore year the student must submit a letter of intent to the program director of the specific program they seek to re-enter. The MIT re-admittance committee will determine if another opportunity will be granted. If re-admittance is approved additional requirements will be prescribed by the MIT committee.

Other requirements such as auditing courses, attending labs, and/or remedial work will be specified by the committee. The student must remain in compliance with committee's recommendations and requirements to satisfy degree progress. When a student attempts unsuccessfully a second time in the same or a different programmatic course, they are terminated from that program. Additionally, if a student receives a "D," "F" or "W" in two or more programmatic courses in one term, they will be dismissed from that program. The student may apply for admittance to a second imaging program under the same application criteria as other applicants. After two unsuccessful attempts to complete two different programs, the student may not apply for a third program.

Career Opportunities

There continues to be a high demand for bachelor's degree prepared medical imaging professionals. Graduates have excellent opportunities for employment in hospitals, clinics, private practice, state and federal agencies, and with appropriate experience, in supervision, education and industry.

Degree Completion Programs

The Diagnostic Medical Sonography, Echocardiography, Radiologic Science and Vascular Technology programs offer degree completion programs for registered technologists (in good standing) who wish to pursue a bachelor's degree in their field. These programs are fully online. There is no requirement to come to campus.

Allied Health, MS

Curriculum

This program will be delivered completely online, a choice of three tracks.

**Students must complete the allied health core courses, as well as one track to receive the MS in Allied Health.*

Core Courses
ALH 505 - Intro to IT for Hlth Care Pros Credit Hours: 1
ALH 510 - The Science of Evidence-Based Medicine Credit Hours: 3
ALH 515 - Scientific Writing & Healcare Credit Hours: 3
ALH 525 - Effective Healthcare Ldshp. Credit Hours: 3
ALH 535 - Asmt. Plan. Imp. and Eval. Credit Hours: 3
ALH 545 - Pertinent Ethical & Legal Cons Credit Hours: 3
ALH 555 - Leadership Theory for HC Ldrs. Credit Hours: 3
ALH 565 - Population Health Issues for Allied Health Professionals Credit Hours: 3
ALH 575 - Methods of Research for Allied Health Professionals Credit Hours: 3
ALH 585 - Financial Consid. & Pol. Strat Credit Hours: 3
ALH 595 - Curriculum Design for AHP Credit Hours: 3

ALH 509 - Masters Capstone Project Credit Hours: 6
or
ALH 599 - Master's Thesis Presentation Credit Hours: 6

Track 1 Administrative / Healthcare Leadership Track in Allied Health
ALH 506 - Program Administration Credit Hours: 3
STAT 505 - Biostatistics I Credit Hours: 3
STAT 515 - Epidemiology I Credit Hours: 3
WRI 510 - Grant Proposal Writing Credit Hours: 3

Track 2 Dental Hygiene Track in Allied Health
ALH 506 - Program Administration Credit Hours: 3
ALH 508 - Medical Ed. Theories & Methods Credit Hours: 3
STAT 505 - Biostatistics I Credit Hours: 3
WRI 510 - Grant Proposal Writing Credit Hours: 3

Track 3 Respiratory Care Track in Allied Health
ALH 508 - Medical Ed. Theories & Methods Credit Hours: 3
RCP 561 - Individual Development Plan Credit Hours: 3
RCP 565 - Clinical Preceptorship Credit Hours: 3
RCP 575 - Accreditation Practicum Credit Hours: 3

Total for a M.S. in Allied Health: 49 Credit Hours

Diagnostic Medical Sonography, BS

Curriculum

Required courses and recommended terms during which they should be taken:

Pre-Medical Imaging Technology
Freshman Year Fall
BIO 231 - Human Anatomy/Physiology I Credit Hours: 4
CHE 101 - Intro to General Chemistry Credit Hours: 3
CHE 104 - Intro to General Chemistry Lab Credit Hours: 1
MATH 111 - College Algebra Credit Hours: 4
MIT 103 - Intro to Med Imaging Credit Hours: 3
Total: 15 Credit Hours

Winter
BIO 232 - Human Anatomy/Physiology II Credit Hours: 4
MATH 112 - Trigonometry Credit Hours: 4
WRI 121 - English Composition Credit Hours: 3
Humanities Elective Credit Hours: 3
Social Science Elective Credit Hours: 3
Total: 17 Credit Hours

Spring
BIO 200 - Medical Terminology Credit Hours: 2
BIO 233 - Human Anatomy/Physiology III Credit Hours: 4

PSY 201 - Psychology Credit Hours: 3
or
PSY 202 - Psychology Credit Hours: 3
or
PSY 203 - Psychology Credit Hours: 3

SPE 111 - Public Speaking Credit Hours: 3
WRI 122 - Argumentative Writing Credit Hours: 3
Total: 15 Credit Hours

Professional Courses

Sophomore Year Fall
BIO 335 - Cross-Sectional Anatomy Credit Hours: 3
DMS 223 - App of Abdominal Sonogr I Credit Hours: 3
DMS 252 - Sophomore Lab I Credit Hours: 1
PHY 217 - Physics of Med Imaging Credit Hours: 3
Humanities Elective Credit Hours: 3
Social Science Elective Credit Hours: 3
Total: 16 Credit Hours

Winter
DMS 224 - App of Abdominal Sonogr II Credit Hours: 3
DMS 235 - DMS Patient Care Credit Hours: 3
DMS 253 - Sophomore Lab II Credit Hours: 1
MIT 231 - Sonographic Princ & Instru I Credit Hours: 4
WRI 227 - Technical Report Writing Credit Hours: 3
Total: 14 Credit Hours

Spring
DMS 225 - App of Abdominal Sonogr III Credit Hours: 3
DMS 234 - Pelvic Sonography Credit Hours: 3
DMS 254 - Sophomore Lab III Credit Hours: 1
MIT 232 - Sonographic Princ & Instru II Credit Hours: 4
Social Science Elective Credit Hours: 3
Total: 14 Credit Hours

Junior Year Fall
DMS 346 - Musculoskeletal Sonography Credit Hours: 3
DMS 352 - Junior Lab I Credit Hours: 1
DMS 365 - Sonographic Pathology Credit Hours: 3
DMS 337 - Breast Sonography Credit Hours: 3
SPE 321 - Small Group/Team Comm Credit Hours: 3
Total: 13 Credit Hours

Winter
BUS 316 - Total Quality Health Care Credit Hours: 3
or
BUS 317 - Health Care Management Credit Hours: 3
or
BUS 313 - Health Care Systems & Policy Credit Hours: 3

DMS 316 - Survey of Vascular Tech Credit Hours: 3
DMS 353 - Junior Lab II Credit Hours: 1
DMS 370 - Obstetrical Sonography Credit Hours: 3
DMS 375 - Fetal Echocardiography Credit Hours: 3
Total: 13 Credit Hours

Spring
DMS 343 - Fetal Echo/Neonatal/Pediatric Credit Hours: 3
DMS 354 - Junior Lab III Credit Hours: 1
DMS 373 - Obstetrical Pathology Credit Hours: 3
DMS 388 - Externship Preparation Credit Hours: 2
Communication Elective Credit Hours: 3
Humanities Elective Credit Hours: 3
Total: 15 Credit Hours

Senior Year Summer
DMS 430 - DMS Externship Credit Hours: 15
Total: 15 Credit Hours

Fall
DMS 430 - DMS Externship Credit Hours: 15
Total: 15 Credit Hours

Winter
DMS 430 - DMS Externship Credit Hours: 15
Total: 15 Credit Hours

Spring
DMS 430 - DMS Externship Credit Hours: 15
Total: 15 Credit Hours

Total for a B.S. in Diagnostic Medical Sonography: 192 Credit Hours

Diagnostic Medical Sonography, Degree Completion, BS

Courses Granted for Registry

DMS 223 - App of Abdominal Sonogr I Credit Hours: 3
DMS 224 - App of Abdominal Sonogr II Credit Hours: 3
DMS 225 - App of Abdominal Sonogr III Credit Hours: 3
DMS 234 - Pelvic Sonography Credit Hours: 3
DMS 235 - DMS Patient Care Credit Hours: 3
DMS 252 - Sophomore Lab I Credit Hours: 1
DMS 253 - Sophomore Lab II Credit Hours: 1
DMS 254 - Sophomore Lab III Credit Hours: 1
DMS 370 - Obstetrical Sonography Credit Hours: 3
DMS 388 - Externship Preparation Credit Hours: 2 (waived)
DMS 430 - Diagnostic Medical Sonography Externship Credit Hours: 45
MIT 103 - Intro to Med Imaging Credit Hours: 3
MIT 231 - Sonographic Princ & Instru I Credit Hours: 4
MIT 232 - Sonographic Princ & Instru II Credit Hours: 4
PHY 217 - Physics of Med Imaging Credit Hours: 3
Total: 80 Credit Hours

Completion Credits

BIO 335 - Cross-Sectional Anatomy Credit Hours: 3

BUS 313 - Health Care Systems & Policy Credit Hours: 3
or
BUS 316 - Total Quality Health Care Credit Hours: 3
or
BUS 317 - Health Care Management Credit Hours: 3

DMS 316 - Survey of Vascular Tech Credit Hours: 3 [a]
DMS 337 - Breast Sonography Credit Hours: 3
DMS 343 - Fetal Echo/Neonatal/Pediatric Credit Hours: 3
DMS 346 - Musculoskeletal Sonography Credit Hours: 3
DMS 352 - Junior Lab I Credit Hours: 1
DMS 353 - Junior Lab II Credit Hours: 1
DMS 354 - Junior Lab III Credit Hours: 1
DMS 365 - Sonographic Pathology Credit Hours: 3
DMS 373 - Obstetrical Pathology Credit Hours: 3
DMS 375 - Fetal Echocardiography Credit Hours: 3
DMS 430A - DMS Externship Credit Hours: 8
DMS 430B - DMS Externship Credit Hours: 7
SPE 321 - Small Group/Team Comm Credit Hours: 3
Communication Elective Credit Hours: 3
Total: 51 Credit Hours

Transfer Courses

BIO 200 - Medical Terminology Credit Hours: 2
BIO 231 - Human Anatomy/Physiology I Credit Hours: 4
BIO 232 - Human Anatomy/Physiology II Credit Hours: 4
BIO 233 - Human Anatomy/Physiology III Credit Hours: 4
CHE 101 - Intro to General Chemistry Credit Hours: 3
CHE 104 - Intro to General Chemistry Lab Credit Hours: 1
MATH 111 - College Algebra Credit Hours: 4
MATH 112 - Trigonometry Credit Hours: 4

PSY 201 - Psychology Credit Hours: 3
or
PSY 202 - Psychology Credit Hours: 3
or
PSY 203 - Psychology Credit Hours: 3

SPE 111 - Public Speaking Credit Hours: 3
WRI 121 - English Composition Credit Hours: 3
WRI 122 - Argumentative Writing Credit Hours: 3
WRI 227 - Technical Report Writing Credit Hours: 3
Humanities Electives Credit Hours: 9
Social Science Electives Credit Hours: 9
Elective Credit Hours: 2
Total: 61 Credit Hours

[a] Credits may be granted for additional specialty registry exams. Please contact Program Director for more information.

Echocardiography, BS

Curriculum

Required Courses and recommended terms during which they should be taken:

Pre-Medical Imaging Technology

Freshman Year Fall

BIO 231 - Human Anatomy/Physiology I Credit Hours: 4
CHE 101 - Intro to General Chemistry Credit Hours: 3
CHE 104 - Intro to General Chemistry Lab Credit Hours: 1
MATH 111 - College Algebra Credit Hours: 4
MIT 103 - Intro to Med Imaging Credit Hours: 3
Total: 15 Credit Hours

Winter
BIO 232 - Human Anatomy/Physiology II Credit Hours: 4
MATH 112 - Trigonometry Credit Hours: 4
WRI 121 - English Composition Credit Hours: 3
Humanities Elective Credit Hours: 3
Social Science Elective Credit Hours: 3
Total: 17 Credit Hours

Spring
BIO 200 - Medical Terminology Credit Hours: 2
BIO 233 - Human Anatomy/Physiology III Credit Hours: 4

PSY 201 - Psychology Credit Hours: 3
or
PSY 202 - Psychology Credit Hours: 3
or
PSY 203 - Psychology Credit Hours: 3

SPE 111 - Public Speaking Credit Hours: 3
WRI 122 - Argumentative Writing Credit Hours: 3
Total: 15 Credit Hours

Professional Courses

Sophomore Year Fall

BIO 220 - Cardiovascular Physiology Credit Hours: 4
ECHO 231 - Echocardiography I Credit Hours: 4
PHY 217 - Physics of Med Imaging Credit Hours: 3
WRI 227 - Technical Report Writing Credit Hours: 3
Total: 14 Credit Hours

Winter
BIO 346 - Pathophysiology I Credit Hours: 3
ECHO 232 - Echocardiography II Credit Hours: 4
MIT 231 - Sonographic Princ & Instru I Credit Hours: 4
Social Science Elective Credit Hours: 3
Total: 14 Credit Hours

Spring
BIO 347 - Pathophysiology II Credit Hours: 3
ECHO 225 - Cardio Patient Mgmt Practices Credit Hours: 3
ECHO 320 - Cardiographic Methods Credit Hours: 3
ECHO 332 - Invasive Cardiology Credit Hours: 3
MIT 232 - Sonographic Princ & Instru II Credit Hours: 4
Total: 16 Credit Hours

Junior Year Fall
BUS 316 - Total Quality Health Care Credit Hours: 3
or
BUS 317 - Health Care Management Credit Hours: 3
or
BUS 313 - Health Care Systems & Policy Credit Hours: 3

ECHO 333 - Echocardiography III Credit Hours: 4
ECHO 321 - Stress & Transesophageal Echo Credit Hours: 3
SPE 321 - Small Group/Team Comm Credit Hours: 3
Humanities Elective Credit Hours: 3
Total: 16 Credit Hours

Winter
CHE 360 - Clinical Pharmacology/Hlth Prf Credit Hours: 3
ECHO 325 - Pediatric Echo Credit Hours: 3
ECHO 376 - Survey of Vascular Testing Credit Hours: 3
Social Science Elective Credit Hours: 3
Total: 12 Credit Hours

Spring
ECHO 334 - Echocardiography IV Credit Hours: 4
ECHO 385 - Echo Lab Management Credit Hours: 3
ECHO 388 - Externship Preparation Credit Hours: 3
Communication Elective Credit Hours: 3
Humanities Elective Credit Hours: 3
Total: 16 Credit Hours

Senior Year Summer
ECHO 420 - Echo Externship Credit Hours: 15
Total: 15 Credit Hours

Fall
ECHO 420 - Echo Externship Credit Hours: 15
Total: 15 Credit Hours

Winter
ECHO 420 - Echo Externship Credit Hours: 15
Total: 15 Credit Hours

Spring
ECHO 420 - Echo Externship Credit Hours: 15
Total: 15 Credit Hours

Total for a B.S. in Echocardiography: 195 Credit Hours

Echocardiography, Degree Completion, BS

Courses Granted for Registry

BIO 220 - Cardiovascular Physiology Credit Hours: 4
BIO 346 - Pathophysiology I Credit Hours: 3
BIO 347 - Pathophysiology II Credit Hours: 3
ECHO 225 - Cardio Patient Mgmt Practices Credit Hours: 3
ECHO 231 - Echocardiography I Credit Hours: 4
ECHO 232 - Echocardiography II Credit Hours: 4
ECHO 320 - Cardiographic Methods Credit Hours: 3
ECHO 321 - Stress & Transesophageal Echo Credit Hours: 3
ECHO 333 - Echocardiography III Credit Hours: 4
ECHO 388 - Externship Preparation Credit Hours: 3 (waived)
ECHO 420 - Echocardiography Externship Credit Hours: 45
MIT 103 - Intro to Med Imaging Credit Hours: 3
MIT 231 - Sonographic Princ & Instru I Credit Hours: 4
MIT 232 - Sonographic Princ & Instru II Credit Hours: 4
PHY 217 - Physics of Med Imaging Credit Hours: 3
Total: 90 Credit Hours

Completion Courses

BUS 313 - Health Care Systems & Policy Credit Hours: 3
or
BUS 316 - Total Quality Health Care Credit Hours: 3
or
BUS 317 - Health Care Management Credit Hours: 3

CHE 360 - Clinical Pharmacology/Hlth Prf Credit Hours: 3
ECHO 325 - Pediatric Echo Credit Hours: 3 [a]
ECHO 332 - Invasive Cardiology Credit Hours: 3
ECHO 334 - Echocardiography IV Credit Hours: 4
ECHO 376 - Survey of Vascular Testing Credit Hours: 3 [a]
ECHO 385 - Echo Lab Management Credit Hours: 3
ECHO 420A - Echo Externship Credit Hours: 8
ECHO 420B - Echo Externship Credit Hours: 7
SPE 321 - Small Group/Team Comm Credit Hours: 3
Communication Elective Credit Hours: 3
Total: 43 Credit Hours

[a] Optional credits may be awarded for additional registries

Transfer Courses

BIO 200 - Medical Terminology Credit Hours: 2
BIO 231 - Human Anatomy/Physiology I Credit Hours: 4
BIO 232 - Human Anatomy/Physiology II Credit Hours: 4
BIO 233 - Human Anatomy/Physiology III Credit Hours: 4
CHE 101 - Intro to General Chemistry Credit Hours: 3
CHE 104 - Intro to General Chemistry Lab Credit Hours: 1
MATH 111 - College Algebra Credit Hours: 4
MATH 112 - Trigonometry Credit Hours: 4

PSY 201 - Psychology Credit Hours: 3
or
PSY 202 - Psychology Credit Hours: 3
or
PSY 203 - Psychology Credit Hours: 3

SPE 111 - Public Speaking Credit Hours: 3
WRI 121 - English Composition Credit Hours: 3
WRI 122 - Argumentative Writing Credit Hours: 3
WRI 227 - Technical Report Writing Credit Hours: 3
Humanities Electives Credit Hours: 9
Social Science Electives Credit Hours: 9
Elective Credit Hours: 3
Total: 62 Credit Hours

Nuclear Medicine and Molecular Imaging Technology, BS

Curriculum

Required courses and recommended terms during which they should be taken:

Pre-Medical Imaging Technology

Freshman Year Fall

BIO 231 - Human Anatomy/Physiology I Credit Hours: 4
CHE 101 - Intro to General Chemistry Credit Hours: 3
CHE 104 - Intro to General Chemistry Lab Credit Hours: 1
MATH 111 - College Algebra Credit Hours: 4
MIT 103 - Intro to Med Imaging Credit Hours: 3
Total: 15 Credit Hours

Winter
BIO 232 - Human Anatomy/Physiology II Credit Hours: 4
MATH 112 - Trigonometry Credit Hours: 4
WRI 121 - English Composition Credit Hours: 3
Humanities Elective Credit Hours: 3
Social Science Elective Credit Hours: 3
Total: 17 Credit Hours

Spring
BIO 200 - Medical Terminology Credit Hours: 2
BIO 233 - Human Anatomy/Physiology III Credit Hours: 4

PSY 201 - Psychology Credit Hours: 3
or
PSY 202 - Psychology Credit Hours: 3
or
PSY 203 - Psychology Credit Hours: 3

SPE 111 - Public Speaking Credit Hours: 3
WRI 122 - Argumentative Writing Credit Hours: 3
Total: 15 Credit Hours

Professional Courses

Sophomore Year Fall

CHE 350 - Clinical Pharmacology/NMT Credit Hours: 3
NMT 212 - Nuc Med Phy/Radiation Biophy Credit Hours: 3
NMT 217 - Patient Care Credit Hours: 4
PHY 217 - Physics of Med Imaging Credit Hours: 3
Total: 13 Credit Hours

Winter
NMT 205 - Nuclear Med Admin Credit Hours: 2
NMT 215 - Radiochem/Radiopharmacy Credit Hours: 4
SPE 321 - Small Group/Team Comm Credit Hours: 3
WRI 227 - Technical Report Writing Credit Hours: 3
Total: 12 Credit Hours

Spring
NMT 225 - Nuclear Phy/Instrumtn Credit Hours: 4
NMT 256 - Cardiovascular Imaging Credit Hours: 3
Communication Elective Credit Hours: 3
Humanities Elective Credit Hours: 3
Total: 13 Credit Hours

Junior Year Fall
BUS 316 - Total Quality Health Care Credit Hours: 3
or
BUS 317 - Health Care Management Credit Hours: 3
or
BUS 313 - Health Care Systems & Policy Credit Hours: 3

MIT 341 - Magnetic Resonance Imaging Credit Hours: 4
NMT 311 - Imaging Procedures I Credit Hours: 4
NMT 367 - PET Imaging Credit Hours: 3
Total: 14 Credit Hours

Winter
BIO 335 - Cross-Sectional Anatomy Credit Hours: 3
BIO 346 - Pathophysiology I Credit Hours: 3
NMT 312 - Imaging Procedures II Credit Hours: 4
NMT 355 - Computed Tomography Credit Hours: 4
Social Science Elective Credit Hours: 3
Total: 17 Credit Hours

Spring
NMT 313 - Therapeutic Procedures Credit Hours: 3
NMT 325 - SPECT Imaging/Comp Appl Credit Hours: 4
NMT 388 - Externship Preparation Credit Hours: 3
Humanities Elective Credit Hours: 3
Social Science Elective Credit Hours: 3
Total: 16 Credit Hours

Senior Year Summer
NMT 410 - Nuclear Med Tech Extern Credit Hours: 15
Total: 15 Credit Hours

Fall
NMT 410 - Nuclear Med Tech Extern Credit Hours: 15
Total: 15 Credit Hours

Winter
NMT 410 - Nuclear Med Tech Extern Credit Hours: 15
Total: 15 Credit Hours

Spring
NMT 410 - Nuclear Med Tech Extern Credit Hours: 15
Total: 15 Credit Hours

Total for a B.S. in Nuclear Medicine and Molecular Imaging Technology: 192 Credit Hours

Radiologic Science, BS

Curriculum

Required courses and recommended terms during which they should be taken:

Pre-Medical Imaging Technology

Freshman Year Fall

BIO 231 - Human Anatomy/Physiology I Credit Hours: 4
CHE 101 - Intro to General Chemistry Credit Hours: 3
CHE 104 - Intro to General Chemistry Lab Credit Hours: 1
MATH 111 - College Algebra Credit Hours: 4
MIT 103 - Intro to Med Imaging Credit Hours: 3
Total: 15 Credit Hours

Winter

BIO 232 - Human Anatomy/Physiology II Credit Hours: 4
MATH 112 - Trigonometry Credit Hours: 4
WRI 121 - English Composition Credit Hours: 3
Humanities Elective Credit Hours: 3
Social Science Elective Credit Hours: 3
Total: 17 Credit Hours

Spring

BIO 200 - Medical Terminology Credit Hours: 2
BIO 233 - Human Anatomy/Physiology III Credit Hours: 4

PSY 201 - Psychology Credit Hours: 3
or
PSY 202 - Psychology Credit Hours: 3
or
PSY 203 - Psychology Credit Hours: 3

SPE 111 - Public Speaking Credit Hours: 3
WRI 122 - Argumentative Writing Credit Hours: 3
Total: 15 Credit Hours

Professional Courses

Sophomore Year Fall

PHY 217 - Physics of Med Imaging Credit Hours: 3
RDSC 201 - Imaging Techniques I Credit Hours: 4
RDSC 205 - Patient Care Credit Hours: 4
RDSC 235 - Equipment Operation & Maint Credit Hours: 3
Communication Elective Credit Hours: 3
Total: 17 Credit Hours

Winter

RDSC 202 - Imaging Techniques II Credit Hours: 4
RDSC 210 - Radiograph Position I Credit Hours: 4
RDSC 366 - Radiographic Pathology Credit Hours: 3
Humanities Elective Credit Hours: 3
Total: 14 Credit Hours

Spring

BIO 335 - Cross-Sectional Anatomy Credit Hours: 3
RDSC 211 - Radiograph Position II Credit Hours: 4
RDSC 233 - Contrast Media Proc Credit Hours: 4
RDSC 272 - Radiation Protection Credit Hours: 3
Elective Credit Hours: 3
Total: 17 Credit Hours

Junior Year Fall

BIO 336 - Essentials of Pathophysiology Credit Hours: 3
RDSC 301 - Radiograph Position III Credit Hours: 4
RDSC 355 - Computed Tomography Credit Hours: 4
Humanities Elective Credit Hours: 3
Total: 14 Credit Hours

Winter

BUS 313 - Health Care Systems & Policy Credit Hours: 3
or
BUS 316 - Total Quality Health Care Credit Hours: 3
or
BUS 317 - Health Care Management Credit Hours: 3

MIT 356 - Magnetic Resonance Imaging Credit Hours: 4
RDSC 320 - Surg/Trauma/Mobl Rdgrph Credit Hours: 4
SPE 321 - Small Group/Team Comm Credit Hours: 3
WRI 227 - Technical Report Writing Credit Hours: 3
Total: 16 Credit Hours

Spring

MIT 341 - Magnetic Resonance Imaging Credit Hours: 4
or
MIT 342 - Mag. Resonance Imaging II Credit Hours: 3
or
RDSC 354 - Mammography Credit Hours: 4

RDSC 326 - Crdvsclr/Interv Tech Credit Hours: 4
RDSC 388 - Externship Preparation Credit Hours: 2
Social Science Elective Credit Hours: 3
Total: 12/13 Credit Hours

Senior Year Summer

RDSC 410 - Rad Science Externship Credit Hours: 15
Total: 15 Credit Hours

Fall

RDSC 410 - Rad Science Externship Credit Hours: 15
Total: 15 Credit Hours

Winter

RDSC 410 - Rad Science Externship Credit Hours: 15
Total: 15 Credit Hours

Spring

RDSC 410 - Rad Science Externship Credit Hours: 15
Total: 15 Credit Hours

Total for a B.S. in Radiologic Science: 197/198 Credit Hours

Radiologic Science, Degree Completion, BS

Courses Granted for Registry

MIT 103 - Intro to Med Imaging Credit Hours: 3
PHY 217 - Physics of Med Imaging Credit Hours: 3
RDSC 201 - Imaging Techniques I Credit Hours: 4
RDSC 202 - Imaging Techniques II Credit Hours: 4
RDSC 205 - Patient Care Credit Hours: 4
RDSC 210 - Radiograph Position I Credit Hours: 4
RDSC 211 - Radiograph Position II Credit Hours: 4
RDSC 233 - Contrast Media Proc Credit Hours: 4
RDSC 235 - Equipment Operation & Maint Credit Hours: 3
RDSC 272 - Radiation Protection Credit Hours: 3
RDSC 301 - Radiograph Position III Credit Hours: 4
RDSC 320 - Surg/Trauma/Mobl Rdgrph Credit Hours: 4
RDSC 388 - Externship Preparation Credit Hours: 2 (waived)
RDSC 410 - Radiologic Science Externship Credit Hours: 45
Total: 89 Credit Hours

Completion Courses

BIO 335 - Cross-Sectional Anatomy Credit Hours: 3
BIO 336 - Essentials of Pathophysiology Credit Hours: 3

BUS 313 - Health Care Systems & Policy Credit Hours: 3
or
BUS 316 - Total Quality Health Care Credit Hours: 3
or
BUS 317 - Health Care Management Credit Hours: 3

MIT 341 - Magnetic Resonance Imaging Credit Hours: 4
RDSC 326 - Crdvsclr/Interv Tech Credit Hours: 4 [a]

RDSC 354 - Mammography Credit Hours: 4 [a]
or
RDSC 355 - Computed Tomography Credit Hours: 4

RDSC 366 - Radiographic Pathology Credit Hours: 3
RDSC 411 - Special Rad Sci Extern Credit Hours: 15
SPE 321 - Small Group/Team Comm Credit Hours: 3
Communication Elective Credit Hours: 3
Total: 45 Credit Hours

[a] Optional credit may be awarded for additional registries

Transfer Courses

BIO 200 - Medical Terminology Credit Hours: 2
BIO 231 - Human Anatomy/Physiology I Credit Hours: 4
BIO 232 - Human Anatomy/Physiology II Credit Hours: 4
BIO 233 - Human Anatomy/Physiology III Credit Hours: 4
CHE 101 - Intro to General Chemistry Credit Hours: 3
CHE 104 - Intro to General Chemistry Lab Credit Hours: 1
MATH 111 - College Algebra Credit Hours: 4
MATH 112 - Trigonometry Credit Hours: 4

PSY 201 - Psychology Credit Hours: 3
or
PSY 202 - Psychology Credit Hours: 3
or
PSY 203 - Psychology Credit Hours: 3

SPE 111 - Public Speaking Credit Hours: 3
WRI 121 - English Composition Credit Hours: 3
WRI 122 - Argumentative Writing Credit Hours: 3
WRI 227 - Technical Report Writing Credit Hours: 3
Humanities Electives Credit Hours: 9
Social Science Electives Credit Hours: 9
Elective Credit Hours: 2
Total: 61 Credit Hours

Vascular Technology, BS

Curriculum

Required courses and recommended terms during which they should be taken:

Pre-Medical Imaging Technology

Freshman Year Fall

BIO 231 - Human Anatomy/Physiology I Credit Hours: 4
CHE 101 - Intro to General Chemistry Credit Hours: 3
CHE 104 - Intro to General Chemistry Lab Credit Hours: 1
ATH 111 - College Algebra Credit Hours: 4
MIT 103 - Intro to Med Imaging Credit Hours: 3
Total: 15 Credit Hours

Winter
BIO 232 - Human Anatomy/Physiology II Credit Hours: 4
MATH 112 - Trigonometry Credit Hours: 4
WRI 121 - English Composition Credit Hours: 3
Humanities Elective Credit Hours: 3
Social Science Elective Credit Hours: 3
Total: 17 Credit Hours

Spring
BIO 200 - Medical Terminology Credit Hours: 2
BIO 233 - Human Anatomy/Physiology III Credit Hours: 4

PSY 201 - Psychology Credit Hours: 3
or
PSY 202 - Psychology Credit Hours: 3
or
PSY 203 - Psychology Credit Hours: 3

SPE 111 - Public Speaking Credit Hours: 3
WRI 122 - Argumentative Writing Credit Hours: 3
Total: 15 Credit Hours

Professional Courses

Sophomore Year Fall

BIO 220 - Cardiovascular Physiology Credit Hours: 4
MIT 225 - Patient Care in Sonography Credit Hours: 3
PHY 217 - Physics of Med Imaging Credit Hours: 3
VAS 214 - Vascular Anatomy Credit Hours: 4
WRI 227 - Technical Report Writing Credit Hours: 3
Total: 17 Credit Hours

Winter
BIO 346 - Pathophysiology I Credit Hours: 3
MIT 231 - Sonographic Princ & Instru I Credit Hours: 4
VAS 246 - Perphrl Arterial Disease Credit Hours: 4
Social Science Elective Credit Hours: 3
Total: 14 Credit Hours

Spring
BIO 347 - Pathophysiology II Credit Hours: 3
MIT 232 - Sonographic Princ & Instru II Credit Hours: 4
VAS 245 - Periphrl Venous Disease Credit Hours: 4
VAS 335 - Radiogrphc Vasclr Anat Credit Hours: 3
Total: 14 Credit Hours

Junior Year Fall
BUS 316 - Total Quality Health Care Credit Hours: 3
or
BUS 317 - Health Care Management Credit Hours: 3
or
BUS 313 - Health Care Systems & Policy Credit Hours: 3

SPE 321 - Small Group/Team Comm Credit Hours: 3
VAS 365 - Abdominal Vasc Disease Credit Hours: 4
VAS 375 - Survey Abdom Sonography Credit Hours: 3
Social Science Elective Credit Hours: 3
Total: 16 Credit Hours

Winter
CHE 360 - Clinical Pharmacology/Hlth Prf Credit Hours: 3
VAS 366 - Spec Circulatory Problms Credit Hours: 4
VAS 337 - Survey of Echocardiography Credit Hours: 3
Humanities Elective Credit Hours: 3
Total: 13 Credit Hours

Spring
VAS 367 - Cerebrovascular Disease Credit Hours: 4
AS 385 - Vascular Lab Mgmt Credit Hours: 3
VAS 388 - Externship Preparation Credit Hours: 3
Communication Elective Credit Hours: 3
Humanities Elective Credit Hours: 3
Total: 16 Credit Hours

Senior Year Summer
VAS 420 - Vascular Tech Extern Credit Hours: 15
Total: 15 Credit Hours

Fall
VAS 420 - Vascular Tech Extern Credit Hours: 15
Total: 15 Credit Hours

Winter
VAS 420 - Vascular Tech Extern Credit Hours: 15
Total: 15 Credit Hours

Spring
VAS 420 - Vascular Tech Extern Credit Hours: 15
Total: 15 Credit Hours

Total for a B.S. in Vascular Technology: 197 Credit Hours

Vascular Technology, Degree Completion, BS

Courses Granted for Registry

BIO 346 - Pathophysiology I Credit Hours: 3
BIO 347 - Pathophysiology II Credit Hours: 3
MIT 103 - Intro to Med Imaging Credit Hours: 3
MIT 231 - Sonographic Princ & Instru I Credit Hours: 4
MIT 232 - Sonographic Princ & Instru II Credit Hours: 4
PHY 217 - Physics of Med Imaging Credit Hours: 3 [a]
VAS 214 - Vascular Anatomy Credit Hours: 4
VAS 225 - Patient Mgmt Practices Credit Hours: 3
VAS 245 - Periphrl Venous Disease Credit Hours: 4
VAS 246 - Perphrl Arterial Disease Credit Hours: 4
VAS 367 - Cerebrovascular Disease Credit Hours: 4
VAS 388 - Externship Preparation Credit Hours: 3 (waived)
VAS 420 - Vascular Technology Externship Credit Hours: 45
Total: 84 Credit Hours

Completion Credits

BIO 220 - Cardiovascular Physiology Credit Hours: 4

BUS 313 - Health Care Systems & Policy Credit Hours: 3
or
BUS 316 - Total Quality Health Care Credit Hours: 3
or
BUS 317 - Health Care Management Credit Hours: 3

CHE 360 - Clinical Pharmacology/Hlth Prf Credit Hours: 3
SPE 321 - Small Group/Team Comm Credit Hours: 3
VAS 335 - Radiogrphc Vasclr Anat Credit Hours: 3
VAS 337 - Survey of Echocardiography Credit Hours: 3
VAS 365 - Abdominal Vasc Disease Credit Hours: 4
VAS 366 - Spec Circulatory Problms Credit Hours: 4
VAS 375 - Survey Abdom Sonography Credit Hours: 3 [a]
VAS 385 - Vascular Lab Mgmt Credit Hours: 3
VAS 420A - Special Vas Tech Extern Credit Hours: 8
VAS 420B - Special Vas Tech Extern Credit Hours: 7
Communication Elective Credit Hours: 3
Total: 51 Credit Hours

Transfer Courses

BIO 200 - Medical Terminology Credit Hours: 2
BIO 231 - Human Anatomy/Physiology I Credit Hours: 4
BIO 232 - Human Anatomy/Physiology II Credit Hours: 4
BIO 233 - Human Anatomy/Physiology III Credit Hours: 4
CHE 101 - Intro to General Chemistry Credit Hours: 3
CHE 104 - Intro to General Chemistry Lab Credit Hours: 1
MATH 111 - College Algebra Credit Hours: 4
MATH 112 - Trigonometry Credit Hours: 4

PSY 201 - Psychology Credit Hours: 3
or
PSY 202 - Psychology Credit Hours: 3
or
PSY 203 - Psychology Credit Hours: 3

SPE 111 - Public Speaking Credit Hours: 3
WRI 121 - English Composition Credit Hours: 3
WRI 122 - Argumentative Writing Credit Hours: 3
WRI 227 - Technical Report Writing Credit Hours: 3
Humanities Electives Credit Hours: 9
Social Science Electives Credit Hours: 9
Elective Credit Hours: 3
Total: 62 Credit Hours

[a] Optional credit may be awarded for additional registries

Magnetic Resonance Imaging (MRI) Certificate

The educational requirement for taking the MR registry is minimal for ARRT registered Radiologic Technologists, but the learning curve is steep. For technologists with little knowledge of MR physics and procedures a certificate is offered on campus and fully online that culminates in completing the didactic and clinical requirements. Online students must have access for clinical practice at their place of employment, and permission from management.

Requirements of the Certificate

Students must earn a "C" or better in all courses to be awarded the certificate.
BIO 335 - Cross-Sectional Anatomy Credit Hours: 3
BIO 375 - Cross Sectional Anatomy II Credit Hours: 3 (Variable 1-3 credit hours)
MIT 341 - Magnetic Resonance Imaging Credit Hours: 4
MIT 342 - Mag. Resonance Imaging II Credit Hours: 3
MIT 365 - Mag. Resonance Imaging Review Credit Hours: 2
MIT 411 - Magnetic Resonance Externship Credit Hours: 5

Picture Archiving and Communication Systems (PACS) Certificate

Medical Imaging Technology students with an interest and aptitude in computer science have a unique opportunity at Oregon Tech. Networked digital imaging has created the need for technologists with specialized training. Career opportunities for managers of image networks are on the rise, but few working technologists have the training to prepare them for entering this field.

With the availability of Computer Systems and Management Information Systems majors at Oregon Tech, a certificate in Picture Archiving and Communication Systems (PACS) is available for motivated students to pursue this opportunity.

Requirements of the Certificate

Students must earn a "C" or better in all courses to be awarded the certificate.
MIT 209 - PACS I: Intro to PACS Credit Hours: 3
MIT 219 - PACS II: Comm and Admin Credit Hours: 3
MIT 229 - PACS III: Tech Req & Imag Qual Credit Hours: 3
MIT 239 - PACS IV: Implem & Sys Mgmt Credit Hours: 3
MIT 249 - PACS V: DICOM Credit Hours: 3
MIT 259 - PACS VI: PACS Security Credit Hours: 3

Medical Laboratory Science

Dawn Taylor, *Department Chair and Program Director*
Associate Professor: D. Taylor
Assistant Professors: R. Brown C. Doty
Instructors: R. Barrett
Adjunct Faculty: The program utilizes faculty physicians and faculty medical laboratory professionals, medical, research, and public health laboratories.
Early Admission MLS Program (EAMLSP) Advisors: Dawn Taylor and Deb Disko (Portland-Metro), Rosalind McClure (Klamath Falls)

Degree Offered

- Bachelor of Science in Medical Laboratory Science (joint degree with Oregon Tech and Oregon Health and Science University – OHSU)

Oregon Tech, in partnership with OHSU, offers a course of study leading to a Bachelor of Science in Medical Laboratory Science degree. Students take coursework that combines a rigorous competency-based science curriculum with community-sponsored clinical training. Graduates are prepared to enter the medical laboratory science profession and to pursue career opportunities in various laboratory settings including medical, research, and public health. Students who successfully complete the degree program are eligible to take the *Medical Laboratory Scientist (MLS)* national board certification examination offered by the *American Society for Clinical Pathology (ASCP)*.

Accreditation

The Medical Laboratory Science professional program is accredited by the *National Accrediting Agency for Medical Laboratory Science (NAACLS)*, 5600 North River Road, Suite 720, Rosemont, Illinois 60018-5119, (773) 714-8880.

Mission Statement

The mission of the Oregon Tech • OHSU Medical Laboratory Science Program is to educate, train, and graduate professionally competent and ethical individuals, committed to life-long learning, and who are prepared to meet current and future workplace challenges in medical laboratory science.

Program of Study

During the *pre-professional phase* of study, students complete a minimum of 95-quarter hours that includes (a) 47-quarter hours of general education coursework, including two college-level math courses, one of which must be statistics; (b) 24-quarter hours of biology (200 level or above) that must include one microbiology course and one immunology course; and (c) 24-quarter hours of chemistry (200 level of above). Students must receive a grade of C or better in all required course work.

Through an application process, students are selected to enter the professional program.

NOTE: Oregon Tech Early Admission MLS Program (EAMLSP) students who complete EAMLSP requirements are automatically admitted to the MLS professional program. For more information on the Early Admission MLS Program, contact the Department of MLS program office at (503) 821-1146 or EAMLSP advisor Rosalind McClure on the Klamath Falls campus at (541) 885-1525.

The MLS professional program is admission-restricted and 15 months (5 consecutive terms) long, beginning in September of the academic year in which a student is admitted and ending in December of the following year. Admitted students spend four quarters completing clinical laboratory science-specific coursework on the Oregon Tech Portland-Metro campus. Upon successful completion of the on-campus work, students are assigned to one or more program-affiliated laboratories to complete an extended fifth term (16 weeks) of clinical training. During clinical training, students spend 40 hours per week applying knowledge and skills to perform a wide variety of testing in a contemporary, accredited medical laboratory and to further develop discipline-specific competency under supervision of clinical instructors. Currently, the Department of MLS maintains affiliations with accredited laboratories in Oregon, Washington, Idaho, Nevada, Arizona, Colorado, Hawaii, and Alaska.

Students admitted to the MLS professional program are guaranteed placement for their clinical training subject to the following policies and procedures:

1. Due to the variable availability of training sites year to year and the nature of contractual agreements with affiliated training sites, student placement at a specific site and term may not be possible. Therefore, placement of students for clinical training is determined by the program in consultation with clinical affiliate training sites.
2. Before beginning clinical training, students must comply with all training site and Oregon standardized administrative requirements including but not limited to immunizations, screening (e.g., background check, drug screen, etc.), trainings (e.g., safety, CPR, etc.), and proof of health insurance coverage valid for the entire clinical training period.
3. All academic and non-academic requirements must be met to the satisfaction of program faculty before a student is permitted to start clinical training.
4. Students are solely responsible for transportation and housing needs associated with their clinical training placement.

Professional Program Application and Admission Requirements

The professional program admits one cohort of students a year. Except for EAMLSP students, all prospective students should submit completed applications from September 1st to December 31st of the preceding year for which an applicant seeks admission. Students can download application instructions and the application forms from URL http://www.oit.edu/portland-metro/academics/degrees/medical-laboratory-science/how-to-apply. Importantly, transfer and post-baccalaureate students must also submit a separate application for admission to Oregon Tech. Prospective students may apply online at URL http://www.oit.edu/portland-metro/admissions. When asked, applicants should select "**Pre MLS**" as their major.
NOTE: **Admission to Oregon Tech does not mean that an applicant has been admitted to the MLS professional program**.

Admission to the professional program is criterion-based, competitive, and decided by the program admissions committee. Admission selection is based upon scholarship, personal qualifications, recommendations from three references, and interview results. Selected candidates are interviewed in February and applicants selected for admission are notified in writing by the Program Director during March. To be eligible for admission, candidates for the MLS professional program must meet the following minimum eligibility requirements:

- **Those applicants who have earned a Baccalaureate degree must have completed a minimum of 95 transferable quarter credit hours to include:**

- **Mathematics**: one college-level math course. Minimum requirements are met by MATH 111 - College Algebra. **Additional required math course**: statistics;
- **Biology**: 24-quarter credit hours that must include one course in immunology and a course in microbiology. The microbiology coursework must include a laboratory component either integral to the course or taken separately; courses must be at the 200-level or above and not survey type. **Highly recommended courses**: general biology, genetics, anatomy and physiology, cellular or molecular biology;
- **Chemistry**: 24-quarter credit hours of chemistry; courses must be at the 200 level or above and not survey type. **Highly recommended courses**: general chemistry, organic chemistry, biochemistry, and quantitative analysis

- Those applicants who have not earned a Baccalaureate degree must have completed a minimum of 95 transferable quarter hours to include the prerequisites listed in 1 above and:
  1. 18-quarter credit hours of Communication course work including specified course work in writing and speech (see Baccalaureate General Education Requirements described elsewhere in this catalog);
  2. 9-quarter credit hours of Humanities course work in topical areas such as Art, Art History or Appreciation, Music, Music History or Appreciation, English (excluding writing and speech), Linguistics, and Philosophy (no more than three credits of activity of performance-based courses may be used in this category); and
  3. 12-quarter credit hours of Social Science course work in topical areas such as Anthropology, Economics, Geography, History, Political Science, Psychology, and Sociology.

Prerequisite course work does not need to be completed to apply, but official transcript(s) documenting completion of all outstanding prerequisite coursework with grades of 'C' or better must be on file with the MLS Department office before any offer of admission is finalized. The Oregon Tech Registrar's office will review each applicant's transcripts to confirm that the requirements are met. Applicants who have met **admission requirements** seven or more years prior to application to the MLS Program must complete additional academic work to qualify. This may be accomplished by:

- Completing a course in chemistry and a course in biology with a grade of C or better; courses must be at the 200-level or above and not survey type; or
- Receiving credit by examination in biochemistry and in microbiology; or
- Achieving a CLEP score at or above 50 on both the biology and chemistry examinations.

Applicants seeking transfer credit from international institutions must provide a credential evaluation from an Oregon Tech-approved credential evaluation service and must meet requirements as described in two above. Contact the Oregon Tech Office of Admissions on-line at http://www.oit.edu/admissions/international-students or by telephone 503.821.1250 or 1.800.422.2017 for additional information.

- All applicants must have a minimum GPA of 2.5 to apply.

Health Insurance and Immunizations

Students admitted to the MLS program are required to have and show proof of comprehensive health insurance coverage. This is because during a student's tenure in the MLS program they will work with patient samples and be in close contact with patients who may be ill. This means MLS program students are at a high risk for exposure to certain infections. Health insurance is not available through the university. Students must acquire this insurance on their own.

Note: MLS program students are NOT permitted to begin the program or attend a clinical externship without demonstrating proof of health insurance. All MLS program students are required to meet immunization requirements as dictated by OARs 409-030-0100 to 409-030-0250. Students will be provided with current information once accepted into the professional program.

Oregon Tech Freshman Advantage: The Early Admission MLS Program

Oregon Tech students who have completed winter term of their freshman year in good academic standing may apply to the Early Admission Medical Laboratory Science Program (EAMLSP). NOTE: Students must have at least 60 credits of pre-professional coursework yet to complete to be eligible for the Early Admission MLS program.

EAMLSP students who meet the following minimum eligibility requirements are automatically admitted to the MLS professional program:

1. At the time of application to the EAMLSP, students must be enrolled at either the Klamath Falls or Portland-Metro Oregon Tech campus with a minimum GPA of 3.0, and have at least 60 credits of pre-professional coursework yet to complete; and
2. A EAMLSP-track student must carry a minimum of 12-credits at Oregon Tech per term; and
3. Complete all pre-professional MLS program coursework with grades of "C" or better; and
4. Earn a minimum GPA of 3.00 in each term; and
5. Maintain a cumulative GPA of at least 3.25 in each term; and
6. Adhere to the Student Life Policies and Regulations and the Oregon Tech Academic Regulations - see the Oregon Tech General Catalog and Oregon Tech Student Handbook;
7. Complete MLS 100 - Introduction to MLS with a grade of "B" or better

Essential Requirements

In accordance with its accreditation standards, the MLS program has established essential requirements. To be admitted and maintain enrollment, participate in, and successfully complete the MLS professional program, a student must meet these non-academic standards of performance:

1. Students must demonstrate the ability to acquire and to communicate information. Specifically, a program student must be able to:
   1. Read for comprehension and follow verbal and written instructions to demonstrate mastery of information presented in coursework, including relevant content in basic science and clinical courses, at a level deemed appropriate by the faculty.
   2. Effectively communicate in written and spoken English in order to transmit information to faculty, staff, peers, and members of the health care team.
   3. Make a correct judgment in seeking supervisory help and consultation in a timely manner.
   4. Competently utilize technology to research, investigate, acquire and present information obtained by observation and experimentation.
   5. Use strategies that minimize miscommunication.

6. At all times and in all circumstances, follow established procedures to safeguard protected patient information communicated by non-electronic and electronic means.

2. Students must demonstrate sufficient motor and sensory function to execute movements required to carry out work assignments in all phases of diagnostic testing, including pre-analytical, analytical, and post-analytical. Specifically, a program student must be able to:
    1. Distinguish physical and/or chemical attributes, including color, shape, size, and fine detail of objects both macroscopically and microscopically.
    2. Demonstrate sufficient dexterity to safely manipulate specimens, laboratory utensils, tools, equipment and instrumentation including computer touch-screens, keyboards and handheld calculators, necessary to obtain and report complete and accurate diagnostic test results.
    3. Demonstrate adequate mobility to attend to duties in the various locations of the medical laboratory work environment.
    4. Use sensory skills to acquire and apply information presented by various means and media, including demonstrations.
    5. Perform sustained, often repetitive physical activity that may require sitting, standing and/or walking for prolonged periods of time.
    6. Accurately read, record, and when necessary, respond to numbers, letters and symbols displayed in print whether transmitted through non-electronic, electronic or other technological media.
    7. Demonstrate proficiency performing a wide range of tests in areas of the contemporary medical laboratory including but not limited to hematology, clinical chemistry, immunohematology, and microbiology, molecular and other emerging diagnostic venues.
3. Students must project an image of professionalism through behavior, speech, and grooming. Each student is to possess requisite knowledge and skill and safely perform a wide variety of test procedures with precision and accuracy. Specifically, a program student must be able to:
    1. Follow established laboratory safety protocols when working with various sample types including blood, urine, and other body fluids and tissues, and with microbial organisms that may be infectious, and hazardous chemicals.
    2. Work accurately and safely under stress and time constraints to make subjective evaluations and decisions when mistakes may have a negative and/or high impact on patient care.
    3. Adapt to changing environments, maintain a professional demeanor and concentration in distracting situations.
    4. Demonstrate attributes that include integrity, responsibility, and tolerance.
    5. Speak, act and perform all work in an ethical manner.
    6. Show respect for self and others.
    7. Work independently as well as cooperatively with others, performing professional obligations in a timely, responsible manner.
    8. Prioritize tasks and accept responsibility for work performed independently and as a team member.
    9. Assess his or her performance, willingly accept criticism, and actively seek ways to improve.

Medical Laboratory Science, BS

Graduation Requirements

BS MLS degree students must complete 181-183 quarter credits hours, maintain a minimum GPA of 2.00, and earn a grade of "C" or better in all professional program courses (MLS) as prescribed by the curriculum outline.

Note: The Portland-Metro campus is a laptop-required campus with resources like laptop specifications, financial aid, and helpful instructions found at http://www.oit.edu/portland-metro/college-costs/bring-your-own-device.

Curriculum

Required courses and recommended terms during which they should be taken:
Note: If a student is admitted into the MLS professional program and has followed this curriculum map, the MLS degree can be completed in 11 terms.

Pre-Medical Laboratory Science

This is the curriculum map to be followed by EAMLSP students.

First Year Fall
Biology Elective Credit Hours (200 level or above): 4
or
Recommended: BIO 211 - Principles of Biology Credit Hours: 4
or
Recommended: BIO 231 - Human Anatomy/Physiology I Credit Hours: 4

Chemistry Elective Credit Hours (200 level or above): 5
or
Recommended: CHE 221 - General Chemistry I Credit Hours: 5

MATH 111 - College Algebra Credit Hours: 4
WRI 121 - English Composition Credit Hours: 3
Total: 16 Credit Hours

Winter
Biology Elective Credit Hours (200 level or above: 4
or
Recommended: BIO 212 - Principles of Biology Credit Hours: 4
or
Recommended: BIO 232 - Human Anatomy/Physiology II Credit Hours: 4

Chemistry Elective Credit Hours (200 level or above): 5
or
Recommended: CHE 222 - General Chemistry II Credit Hours: 5

WRI 122 - Argumentative Writing Credit Hours: 3
Humanities Elective Credit Hours: 3
Social Science Elective Credit Hours: 3
Total: 18 Credit Hours

Spring
Biology Elective Credit Hours (200 level or above): 4
or
Recommended: BIO 213 - Principles of Biology Credit Hours: 4
or
Recommended: BIO 233 - Human Anatomy/Physiology III Credit Hours: 4

Chemistry Elective Credit Hours (200 level or above): 5
or
Recommended: CHE 223 - General Chemistry III Credit Hours: 5

MLS 100 - Introduction to MLS Credit Hours: 2 (only required for MLS early admission track students)
SPE 111 - Public Speaking Credit Hours: 3
Social Science Elective Credit Hours: 3
Total: 15/17 Credit Hours

Second Year Fall
BIO 345 - Medical Microbiology Credit Hours: 5
Chemistry Elective Credit Hours (200 level or above): 4
Communication Elective Credit Hours: 3 [a]
Statistics Elective Credit Hours: 4
Total: 16 Credit Hours

Winter
Biology Elective Credit Hours (200 level or above): 3
Chemistry Elective Credit Hours (200 level or above): 4
Communication Elective Credit Hours: 3 [a]
Humanities Elective Credit Hours: 3
Social Science Elective Credit Hours: 3
Total: 16 Credit Hours

Spring
BIO 436 - Immunology Credit Hours: 4
Chemistry Elective Credit Hours (200 level or above): 4
Communication Elective Credit Hours: 3 [a]
Humanities Elective Credit Hours: 3
Social Science Elective Credit Hours: 3
Total: 17 Credit Hours

Communication Electives
Students must choose courses from the following list:
COM 205 - Intercultural Comm Credit Hours: 3 [a]
COM 225 - Interpers Communication Credit Hours: 3
COM 320 - Advanced Intercultural Comm Credit Hours: 3 [a]
COM 347 - Negotiation & Conflict Resol'n Credit Hours: 3
COM 401 - Civil Engineering Project I Credit Hours: 3
SPE 314 - Argumentation Credit Hours: 3
SPE 321 - Small Group/Team Comm Credit Hours: 3
WRI 123 - Research Writing Credit Hours: 3
WRI 214 - Business Correspondence Credit Hours: 3
WRI 227 - Technical Report Writing Credit Hours: 3
WRI 327 - Advanced Tech Writing Credit Hours: 3
WRI 328 - Style Credit Hours: 3
WRI 350 - Documentation Develop Credit Hours: 3
WRI 410 - Proposal & Grant Writing Credit Hours: 3
[a] COM 205 and COM 320 **may not** be used to satisfy both Communication and Humanities credits

Professional Courses

All senior level courses require admission to the Medical Laboratory Science Program or instructor consent.

Professional Courses Fall
MLS 420 - Clinic Immun & Infect Serology Credit Hours: 5
MLS 474 - Medical Parasitology Credit Hours: 2
MLS 432 - Foundations of MLS I Credit Hours: 4
MLS 442 - Hematology I Credit Hours: 6
Total: 17 Credit Hours

Winter
MLS 415 - Clinical Chemistry I Credit Hours: 6
MLS 444 - Microbiology I Credit Hours: 6
MLS 452 - Hematology II Credit Hours: 5
MLS 462 - Foundations of MLS II Credit Hours: 2
Total: 19 Credit Hours

Spring
MLS 416 - Clinical Chemistry II Credit Hours: 6
MLS 417 - Clinical Chemistry III Credit Hours: 2
MLS 443 - Immunohematology I Credit Hours: 4
MLS 445 - Microbiology II Credit Hours: 4
MLS 449 - Principles of Urinalysis Credit Hours: 3
Total: 19 Credit Hours

Summer
MLS 422 - Molecular Diagnostic Methods Credit Hours: 3
MLS 424 - Hemostasis Credit Hours: 3
MLS 453 - Immunohematology II Credit Hours: 3
MLS 462 - Foundations of MLS II Credit Hours: 3
Total: 12 Credit Hours

Fall
MLS 463 - Foundations of MLS III Credit Hours: 1
MLS 470 - Chemistry & Immunology Extern Credit Hours: 4
MLS 471 - Hematology Externship Credit Hours: 4
MLS 472 - Microbiology Externship Credit Hours: 4
MLS 473 - Immunohematology Extern Credit Hours: 3
Total: 16 Credit Hours

Total for a B.S. Medical Laboratory Science: 181-183 Credit Hours

Natural Sciences Department

Ken Usher, *Department Chair*
Lloyd Parratt, *Associate Department Chair*
Professors: H.-Y. Li, R. McClure, T. McVay, E. Schechtel, K. Usher, R. Wilde
Associate Professors: S. Anthony, M. Hughes, J. Kellermann, T. Lund, G. Pak, L. Parratt
Assistant Professors: T. Elliott, K. Farris, D. Johnston

Degrees Offered

- Bachelor of Science in Biology-Health Sciences
- Bachelor of Science in Environmental Sciences

Minors Offered

- Applied Physics
- Biology
- Chemistry
- Coaching
- Sustainability

The Department of Natural Sciences prepares students for challenging, rewarding careers in health, biological, and environmental sciences. The department also provides courses in biology, chemistry, and physics in support of degrees in nursing, medical imaging, dental hygiene, respiratory care, management and engineering programs.

Biology Programs

Many students have an interest in biology. At Oregon Tech we have designed two programs that prepare graduates for rewarding careers that require a strong foundation in biology. For outdoor or field-oriented options, please refer to the Environmental Sciences program in our department. It offers several emphases, including Watershed Science, which can readily be tailored to biological interests and student research projects. Graduates from our Environmental Sciences program often go on to careers with public and private agencies such as US Fish and Wildlife Service, US Forest Service and the Nature Conservancy. For medically-oriented options in biology, please see our Biology-Health Sciences program. It offers a strong preparation to apply to professional programs, exceeding the minimum requirements for highly competitive fields such as Medicine, Pharmacy, Dentistry, Veterinary Medicine, Physician Assistant, and others.

Biology-Health Sciences Program

Hui-Yun Li, *Program Director*

Degree Offered

- Bachelor of Science in Biology-Health Sciences

Objective and Career Opportunities

If you are interested in pre-medical, pre-dental, pre-veterinary, pre-pharmacy, pre-physical therapy, etc., then this is the major you want. The degree program provides an intensive course of study in the basic sciences, social sciences, communication, and mathematics to prepare students for entry into professional programs. The program will meet prerequisite requirements for graduate schools of medicine, dentistry, veterinary medicine, osteopathic medicine, optometry, pharmacy, podiatry, physician assistant, physical therapy and occupational therapy. Courses in health management, medical microbiology, biochemistry, and molecular & cell biology also provide strong preparation for graduate work in biotechnology, public health, and medical administration. This major can also prepare one for a career in education with an emphasis in biology.

Student Preparation

The Biology-Health Sciences curriculum is a demanding instructional program requiring considerable effort in science and mathematics coursework. Prospective students are advised to complete two to three years of high school mathematics and a minimum of three years of high school science (biology, chemistry, and physics).

Pre-Professional Program in Dentistry

Elvira Schechtel, *Advising Coordinator*

The pre-professional program in dentistry prepares the student for entrance into dental school. While the requirements for admission to dental schools vary and some will accept students earlier, a bachelor's degree is highly encouraged for acceptance. In fact, 82% of first-year dental students have completed a four-year baccalaureate degree before starting dental school and 90% have four years of pre-dental college courses before acceptance. The curriculum at Oregon Institute of Technology provides the prerequisite courses for dental school including a full year of general biology, general chemistry, organic chemistry, biochemistry, advanced anatomy & physiology, and physics. All of these have year-long labs. In addition, health-specific courses in cell biology, clinical pharmacology, medical genetics, medical microbiology, neuroscience, nutrition, pathophysiology, and immunology are taken along with calculus, humanities, psychology, and English composition courses.

Because the pre-dental requirements for each dental school vary slightly, it is suggested by sophomore year of college that students look at the requirements for several dental schools along with their dream school. It is also recommended that students do not use AP credit to fill prerequisites for dental school since most do not accept them. There are eight advisors in Oregon Tech's pre-dental program and it is encouraged that students work closely with the advisor they connect best with. The Biology-Health Sciences Program also urges students to begin volunteering in dental settings, possibly during high school and especially during college. For students still in high school, it is advisable to enroll in many sciences courses before college to help prepare for future success.

Admission to dental school is very competitive and requires strong academic achievement. Besides a strong college GPA and application, students must take the dental admission test (DAT) offered by the American Dental Association. The test measures a student's comprehension of scientific information and academic ability. Once accepted, it will take approximately four years to complete dental school.

For complete program requirements and a list of appropriate courses, please see the Biology-Health Sciences Program. Completion of this program will lead to a Bachelor of Science in Biology-Health Sciences.

Pre-Professional Program in Medicine

Elvira Schechtel, *Advising Coordinator*

This program prepares students for entrance into medical school and is often referred to as pre-med. The curriculum at Oregon Institute of Technology provides a pathway to complete all the prerequisites that medical schools like to see and more. There are eight advisors in the pre-med program and students are encouraged to work closely with the advisor they connect best with. Advisors guide students on courses selection, job or volunteer experience, and lead them through the medical school application process. Admission into medical school requires a four-year bachelor's degree with a preference for a science major over a non-science major. Once accepted, medical school then requires approximately four years of education and three to six years of internship and residency. More than 17,000 students enter medical school each year with half of the class being women.

Students are urged to volunteer in medical settings, possibly during high school and especially during college. For students currently in high school, it is advised that the student enrolls in many sciences courses before college to help them prepare for future success. It is recommended that students do not use AP credit to fill medical school prerequisites since they often do not accept them. Nonetheless, it is encouraged to take AP courses in high school since the rigor is excellent college preparation.

Students considering a career in medicine should explore the websites of the schools they have interest in as the prerequisites for each may vary. Students are suggested to read the Medical School Admissions Requirements (MSAR) published by the Association of American Medical Colleges. The pre-med program at Oregon Tech includes a full year of general biology, general chemistry, organic chemistry, biochemistry, advanced anatomy & physiology, and physics. All of these have year-long labs. In addition, health-specific courses in cell biology, clinical pharmacology, medical genetics, medical microbiology, neuroscience, nutrition, pathophysiology, and immunology are taken along with calculus, humanities, psychology, and English composition courses. While the curriculum is very challenging, admission into medical school is highly competitive and requires strong academic achievement. The coursework at Oregon Tech helps students prepare for the medical college admission test (MCAT) required by nearly all medical schools. The test, which is divided into four sections includes physical sciences, biological sciences, verbal reasoning, and writing sample, is used to predict a student's ability to succeed academically.

For complete program requirements and a list of appropriate courses please see the Biology-Health Sciences Program. Completion of this program will lead to a Bachelor of Science in Biology-Health Sciences.

Pre-Professional Program in Pharmacy

Elvira Schechtel, *Advising Coordinator*

A pharmacy degree normally takes four years to complete. Most first-year pharmacy students have completed four years of undergraduate education and possess a bachelor's degree in the sciences. One also must complete the prerequisites for the pharmacy school. The curriculum at Oregon Institute of Technology provides the prerequisite courses including a full year of general biology, general chemistry, organic chemistry, biochemistry, advanced anatomy & physiology, and physics. All of these have year-long labs. Additional courses in cell biology, clinical pharmacology, medical genetics, medical microbiology, neuroscience, nutrition, pathophysiology, and immunology are taken along with calculus, humanities, psychology, statistics and English composition courses.

The pre-professional program in pharmacy at Oregon Tech has eight advisors and students are encouraged to work closely with the advisor they connect best with. Students are urged to begin volunteering in pharmacy settings, possibly during high school and especially during college. For students currently in high school, it is recommend to shadow and talk with pharmacists and to take many science courses before college to help prepare for future success.

The application process to pharmacy school is done through the Pharmacy College Application Service (PharmCAS). Students are encouraged to look at their web site while also looking at the sites of schools they have an interest in. Some pharmacy schools require the Pharmacy College Admissions Test (PCAT). Oregon State University and the pharmacy schools in California do not. Admission to school is competitive so a strong undergraduate GPA, community service, and communications and leadership skills will help.

For complete program requirements and a list of appropriate courses please see the Biology-Health Sciences Program. Completion of this program will lead to a Bachelor of Science in Biology-Health Sciences.

Pre-Professional Program in Veterinary Medicine

Elvira Schechtel, *Advising Coordinator*

The pre-professional program in veterinary medicine prepares students for entrance into veterinary school. There are twenty-eight veterinary schools in the United States and it is highly recommended that students visit the websites of the schools they are interested in. The prerequisites for each school vary slightly. There are eight advisors in the program and students should work closely with the advisor they connect best with.

Admission to veterinary school is competitive and requires a good undergraduate GPA in addition to shadowing or working with a veterinarian. Students are encouraged to work in a clinical practice, volunteer in an animal shelter, or work at a zoo or rehabilitation facility while completing their undergraduate courses. Students currently in high school should continue to take sciences courses and, if available, be involved in 4H or FFA. Advisors recommend that students do not use AP credit to fill prerequisites for veterinary school since most do not accept them.

Being a resident of a state that has a veterinary school is also a major advantage to being accepted since most schools take few out-of-state applicants. If the student's home state does not have a veterinary school, hopefully the state "buys" seats from a veterinary school in a neighboring state for its residents. The WICHE program in the western United States allows out-of-state students to attend veterinary school at Colorado State University at Fort Collins, Oregon State University, Washington State University or the University of California at Davis veterinary schools for in-state tuition.

Many veterinary schools require students to take the general test of the Graduate Record Examination (GRE). It is offered monthly and is often taken in the junior year of undergrad. The majority of first-year veterinary student have completed their bachelor's degree at a four-year university.

The program at Oregon Institute of Technology offers the prerequisite courses (and more) for veterinary school including a full year of general biology, general chemistry, organic chemistry, biochemistry, advanced anatomy & physiology, and physics. All of these have year-long labs. In addition, health-specific courses in wildlife rehabilitation, cell biology, clinical pharmacology, medical genetics, medical microbiology, neuroscience, nutrition, pathophysiology, and immunology are taken along with calculus, humanities, psychology, English composition and public speaking courses. Business-related courses are also recommended.

For complete program requirements and a list of appropriate courses please see the Biology – Health Sciences Program. Completion of this program will lead to a Bachelor of Science in Biology – Health Sciences.

Environmental Sciences Program

Jherime Kellermann, *Program Director*

Degree Offered

- Bachelor of Science in Environmental Sciences

Dual Major Options

- Bachelor of Science in Civil Engineering and Environmental Sciences
  Advising Coordinators: Erin Cox and Jherime Kellermann
- Bachelor of Science in Renewable Energy Engineering and Environmental Sciences
  Advising Coordinators: Mason Terry and Jherime Kellermann

The Bachelor of Science degree in Environmental Sciences program focuses on interdisciplinary scientific study of ecology, natural resources, and sustainability with emphases on management, research, and communication. The curriculum is comprised of four integrated core areas in ecology and natural resources; data analysis and statistics; geographic information systems (GIS); and social sciences.

Emphasis is placed on active experiential learning, particularly in the field. The program offers numerous and diverse opportunities for students to engage in applied research and resource management projects with the support of faculty and professionals through local and regional partnerships.

Objectives

Upon completion of the program, students will have demonstrated the following abilities:

1. A strong working knowledge in foundations of ecology, natural resources, and sustainability
2. Insights into humanity’s role in the world’s biggest challenges including climate change, sustainable resource use, and environmental health and justice
3. The application of scientific reasoning and analytical methods to study natural phenomena
4. Geospatial literacy through map interpretation and navigation, and the application of geographic information systems to address geospatial problems
5. Design, execute, and communicate scientific projects

Student Preparation

We believe there is a place in our program for everyone with an interest in natural resources, environmental issues, conservation and sustainability, or just being in the great outdoors! Environmental science and natural resources is a huge field that can accommodate a wide range in individual interest and skills whether it’s working with wild animals, plants, people, or computers and technology. We encourage students to explore the diversity of job opportunities with federal, state, and tribal agencies, non-governmental organizations (NGOs), and private industries to help guide your studies.

Career Opportunities

Our faculty and partners are here to help you build an impressive resume of academic and work experience that will place you in the job or graduate program of your choices. Graduates can expect to find employment in federal, state, and tribal government agencies, non-governmental organizations (NGOs), and education and research institutions. Students are also well prepared to enter graduate school. Students graduating from our program have taken positions with the U.S. Geological Survey, U.S. Bureau of Reclamation, U.S. Bureau of Land Management, U.S. Fish and Wildlife Service, U.S. Forest Service, Oregon Department of Forestry, Oregon State Police Wildlife Enforcement, Klamath County Health Department, Klamath Irrigation District, Klamath County Soil and Water Conservation District, the Nature Conservancy, and JELD-WEN Windows and Doors.

Physical Education and Health Education

Physical Education Philosophy and Courses

At Oregon Institute of Technology, the physical education philosophy is that every man and woman can achieve and maintain fitness through a sound program based on varied developmental, sport, and recreational activities. The physical education courses provide basic instruction in vigorous activities. Course offerings include fitness training, weight lifting, aerobics activities, archery, ice skating, rugby, recreational basketball, tai chi, Zumba, yoga, kick boxing, core strength & balance, Pilates, rowing, belly dance, scuba, swim classes, relaxation & flexibility, varsity sports and major sports seminars, including weight loss and weight loss management. Other offerings include wilderness navigation, cross country skiing and snowshoeing.

Health Education Philosophy and Courses

Selected courses in health education are provided to assist students to prevent physical and mental health disorders and to promote well-being.

Course Policy

Physical education courses are currently offered as elective credits only. Some courses may require an additional course fee depending on facility and special equipment needs. There is no limit on the number of times a physical education course can be repeated.

Biology-Health Sciences, BS

Degree Requirements

The minimum graduation requirement is 181 credit hours of prescribed coursework. Students must meet the general education requirements, as stated elsewhere in this catalog, and satisfactorily complete the courses listed in this curriculum to obtain a Bachelor of Science degree in Biology-Health Sciences. Biology-Health Sciences students must complete every science course with a minimum grade of "C" and must maintain a minimum grade point average of 2.5 in lower division science courses to advance to upper-division science courses in the major.

Because the prerequisite requirements and recommended courses for entry into health professions and graduate schools differ, some upper-division courses may be substituted for others, with approval of your academic advisor.

Curriculum

Required courses and recommended terms during which they should be taken:

Freshman Year Fall
BIO 211 - Principles of Biology Credit Hours: 4
MATH 111 - College Algebra Credit Hours: 4
WRI 121 - English Composition Credit Hours: 3
Social Science Elective Credit Hours: 3
Total: 14 Credit Hours

Winter
BIO 109 - Intro to Medical Sciences Credit Hours: 2
BIO 212 - Principles of Biology Credit Hours: 4
MATH 112 - Trigonometry Credit Hours: 4
WRI 122 - Argumentative Writing Credit Hours: 3
Social Science Elective Credit Hours: 3
Total: 16 Credit Hours

Spring
BIO 213 - Principles of Biology Credit Hours: 4
MATH 361 - Statistical Methods I Credit Hours: 4 [a]
Health Biology Elective Credit Hours: 2 (lower-division) [b]
Humanities Elective Credit Hours: 3
Total: 13 Credit Hours

Sophomore Year Fall
BIO 345 - Medical Microbiology Credit Hours: 5
CHE 221 - General Chemistry I Credit Hours: 5
MATH 251 - Differential Calculus Credit Hours: 4
SPE 111 - Public Speaking Credit Hours: 3
Total: 17 Credit Hours

Winter
BIO 209 - Current Research Tpc Med Sci I Credit Hours: 1
CHE 222 - General Chemistry II Credit Hours: 5
MATH 252 - Integral Calculus Credit Hours: 4
SPE 321 - Small Group/Team Comm Credit Hours: 3 [f]
Health Biology Elective Credit Hours: 3 (upper-division) [c]
Total: 16 Credit Hours

Spring
CHE 223 - General Chemistry III Credit Hours: 5
WRI 227 - Technical Report Writing Credit Hours: 3
Health Biology Elective Credit Hours: 4 (upper-division) [c]
Humanities Elective Credit Hours: 3
Total: 15 Credit Hours

Junior Year Fall
BIO 331 - Human Anatomy/Physiology I Credit Hours: 5
CHE 331 - Organic Chemistry I Credit Hours: 4
PHY 221 - General Physics w/Calculus Credit Hours: 4 [d]
Total: 13 Credit Hours

Winter
BIO 332 - Human Anatomy/Physiology II Credit Hours: 5
CHE 332 - Organic Chemistry II Credit Hours: 4
PHY 222 - General Physics w/Calculus Credit Hours: 4 [d]
Humanities Elective Credit Hours: 3
Total: 16 Credit Hours

Spring
BIO 333 - Human Anatomy/Physiology III Credit Hours: 5
CHE 333 - Organic Chemistry III Credit Hours: 4
PHY 223 - General Physics w/Calculus Credit Hours: 4 [d]
WRI 327 - Advanced Tech Writing Credit Hours: 3 [g]
Total: 16 Credit Hours

Senior Year Fall
CHE 450 - Biochemistry I Credit Hours: 4
Health Biology Elective Credit Hours: 3 (upper-division) [c]
Social Science Elective Credit Hours: 3
Elective Credit Hours: 3 [e]
Elective Credit Hours: 3 [e]
Total: 16 Credit Hours

Winter
BIO 346 - Pathophysiology I Credit Hours: 3
BIO 409 - Crnt Rsch Tpcs in Med Sci II Credit Hours: 2
CHE 451 - Biochemistry II Credit Hours: 4
Social Science Elective Credit Hours: 3
Elective Credit Hours: 3
Total: 15 Credit Hours

Spring
Health Biology Elective Credit Hours: 3 (upper-division) [c]
Health Biology Elective Credit Hours: 4 (upper-division) [c]
Health Biology Elective Credit Hours: 4 (upper-division) [c]
Elective Credit Hours: 3 [e]
Total: 14 Credit Hours

Total for a B.S. in Biology-Health Sciences: 181 Credit Hours

Health Biology Electives (lower-division):
BIO 200 - Medical Terminology Credit Hours: 2
BIO 205 - Nutrition Credit Hours: 3
BIO 216 - Intro to Veterinary Medicine Credit Hours: 4
BIO 226 - Intro to Wildlife Rehab Credit Hours: 3

Health Biology Electives (upper-division):
BIO 326 - Parasitology Credit Hours: 4
BIO 341 - Medical Genetics Credit Hours: 3
BIO 342 - Cell Biology Credit Hours: 4
BIO 347 - Pathophysiology II Credit Hours: 3
BIO 352 - Developmental Biology Credit Hours: 4
BIO 357 - Intro to Neuroscience Credit Hours: 3

BIO 426 - Evolutionary Biology Credit Hours: 3
BIO 435 - Exercise Physiology Credit Hours: 3
BIO 436 - Immunology Credit Hours: 4
BIO 461 - Human Cadaver Dissection Credit Hours: 1
BIO 462 - Human Cadaver Dissection Credit Hours: 1
BIO 495 - Research Project in Biology Credit Hours: Varies (1-4)
CHE 360 - Clinical Pharmacology/Hlth Prf Credit Hours: 3
CHE 452 - Biochemistry III Credit Hours: 4
CHE 495 - Research Project in Chemistry Credit Hours: Varies (1-4)
STAT 414 - Stat Methods in Epidemiology Credit Hours: 4

[a] MATH 361 may be replaced by MATH 243
[b] Minimum of 2 credits of lower-division health biology elective must be completed, chosen from the lower-division list above. Alternately, an additional elective from the upper-division list may be taken, in which case a total of at least 23 credits of upper-division health biology electives are required
[c] Minimum of 21 credits of upper-division health biology electives must be completed, chosen from the upper-division list above
[d] PHY 221, PHY 222, PHY 223, may be replaced by PHY 201, PHY 202, PHY 203 with advisor consent
[e] Advisor approval of all elective choices is required. Additional courses from the health biology lists above, and/or suitable courses from BUS, COM, ENV, MATH, PSY, or SOC are recommended
[f] SPE 321 may be replaced by COM 205 or COM 225
[g] WRI 327 may be replaced by WRI 345 or WRI 410

Note: When choosing electives or substituting courses, students are responsible for completing a minimum of 60 credits of upper-division work before a degree will be awarded. Upper-division work is defined as 300 and 400 level classes at a bachelor's degree granting institution.

Environmental Sciences, BS

Degree Requirements

Students must meet the general education requirements, as stated elsewhere in this catalog, and complete the courses listed in the curriculum to obtain a Bachelor of Science in Environmental Sciences. A total of 183 credits are required for the degree. Students are encouraged to develop a technical emphasis area based on their own interests.

Students are required to pass each science course with a grade of "C" or better. This requirement is based on the quantitative skills needed in later courses as well as the degree of integration in subject material that is present throughout the program.

The Environmental Sciences Curriculum

The Environmental Sciences curriculum integrates "hands-on" skills and knowledge. Field or laboratory work are important components of many ES courses. Several freshman and sophomore courses allow a student to develop skills in computer applications, Geographic Information Systems (GIS), Global Positioning Systems (GPS), simulation modeling, and field assessment methods.

Curriculum

Required courses and recommended terms during which they should be taken:

Freshman Year Fall
BIO 211 - Principles of Biology Credit Hours: 4
ENV 108 - Mentorship and Team Building Credit Hours: 1
ENV 111 - Intro to Env Sciences Credit Hours: 4
GEOG 105 - Physical Geography Credit Hours: 4
GIS 103 - The Digital Earth Credit Hours: 3
Total: 16 Credit Hours

Winter
BIO 212 - Principles of Biology Credit Hours: 4
GIS 134 - Geographic Info Systems Credit Hours: 3
MATH 111 - College Algebra Credit Hours: 4
WRI 121 - English Composition Credit Hours: 3
Total: 14 Credit Hours

Spring
BIO 213 - Principles of Biology Credit Hours: 4
GIS 205 - Mobile and Web GIS Credit Hours: 2
MATH 112 - Trigonometry Credit Hours: 4
WRI 122 - Argumentative Writing Credit Hours: 3
Total: 13 Credit Hours

Sophomore Year Fall
CHE 221 - General Chemistry I Credit Hours: 5
ENV 108 - Mentorship and Team Building Credit Hours: 1
ENV 217 - Intro to Nat Res Mgmnt Credit Hours: 4
MATH 251 - Differential Calculus Credit Hours: 4
SPE 111 - Public Speaking Credit Hours: 3
Total: 17 Credit Hours

Winter
CHE 222 - General Chemistry II Credit Hours: 5
ENV 224 - Scientific Reason & Method Credit Hours: 3

ECO 201 - Prin of Microeconomics Credit Hours: 3
or
ECO 202 - Prin of Macroeconomics Credit Hours: 3

Humanities Elective Credit Hours: 3
Social Science Elective Credit Hours: 3
Total: 17 Credit Hours

Spring
CHE 223 - General Chemistry III Credit Hours: 5
ENV 226 - Environmental Data Analysis Credit Hours: 3
WRI 227 - Technical Report Writing Credit Hours: 3
Technical Elective Credit Hours: 4 [a]
Total: 15 Credit Hours

Junior Year Fall
ENV 108 - Mentorship and Team Building Credit Hours: 1
ENV 355 - Careers/Professionalism in Env Sci Credit Hours: 3

PHY 201 - General Physics Credit Hours: 4
or
PHY 221 - General Physics w/Calculus Credit Hours: 4

Social Science Elective Credit Hours: 3
Technical Elective Credit Hours: 4 [a]
Total: 15 Credit Hours

Winter
CHE 315 - Environmental Chem/Toxicology Credit Hours: 3
ENV 314 - Env. Science, Law, & Policy Credit Hours: 3
MATH 361 - Statistical Methods I Credit Hours: 4
Technical Elective Credit Hours: 3 [a]
Total: 13 Credit Hours

Spring
CHE 465 - Fate/Transport of Pollutants Credit Hours: 4
ENV 434 - Advanced Data Analysis Credit Hours: 4
Plant Elective Credit Hours: 4 [b]
Technical Elective Credit Hours: 4 [a]
Total: 16 Credit Hours

Senior Year Fall
ENV 108 - Mentorship and Team Building Credit Hours: 1
SPE 321 - Small Group/Team Comm Credit Hours: 3
Technical Elective Credit Hours: 3[a]
Technical Elective Credit Hours: 4 [a]
Upper Division WRI Elective Credit Hours: 3 [c]
Total: 14 Credit Hours

Winter
ENV 485 - Ecoregional Management Credit Hours: 3
Humanities Elective Credit Hours: 3
Social Science Elective Credit Hours: 3
Technical Elective Credit Hours: 4
Technical Elective Credit Hours: 3
Total: 15 Credit Hours

Spring
ENV 484 - Sustainable Human Ecology Credit Hours: 4
Humanities Elective Credit Hours: 3
Wildlife Elective Credit Hours: 4 [d]
Technical Elective Credit Hours: 3 [a]
Total: 15 Credit Hours

Total for a B.S. in Environmental Science: 180 Credit Hours

[a] 32 total credits of technical electives are required to graduate
[b] Choice of BIO 313, BIO 367 or ENV 375 (additional courses taken from this list count as Technical Elective credit)
[c] Choice of WRI 327, WRI 328, WRI 345, WRI 350, or WRI 410
[d] Choice of BIO 366, BIO 377, or BIO 386 (additional courses taken from this list count as Technical Elective credit)

Technical Electives

BIO 107, BIO 207, BIO 307, BIO 407
BIO 313 - Botany Credit Hours: 4
BIO 337 - Aquatic Ecology Credit Hours: 4
BIO 354 - Environmental Health Credit Hours: 3
BIO 366 - Zoology Credit Hours: 4
BIO 367 - Plant Ecology Credit Hours: 4
BIO 377 - Wildlife Ecology Credit Hours: 4
BIO 386 - Ornithology Credit Hours: 4
BIO 426 - Evolutionary Biology Credit Hours: 3
BIO 446 - Conservation Biology Credit Hours: 3
CE 374 - Hydrology Credit Hours: 4
CE 405 - Sustainability & Infrastruct Credit Hours: 3
CE 489 - Treatment Wetlands Credit Hours: 3
CHE 107, CHE 207, CHE 307, CHE 407
CHE 331 - Organic Chemistry I Credit Hours: 4
ENV 107, ENV 207, ENV 307, ENV 407
ENV 214 - Watershed Sci & Tech Credit Hours: 3
ENV 365 - Adv Field Methods in Env Sci Credit Hours: 3
ENV 375 - Forest Ecology & Management Credit Hours: 4
ENV 420 Externship in Env Sci Credit Hours: Varies (1-9)
ENV 465 - Ecological Resto. & Monitoring Credit Hours: 4
ENV 469 - Treatment Wetlands Credit Hours: 3
ENV 495 - Research in Env. Sciences Credit Hours: 4
GEOG 107, GEOG 207, GEOG 307, GEOG 407 [d]
GEOG 335 - Soils Credit Hours: 4
GEOL 107, GEOL 207, GEOL 307, GEOL 407
GIS 306 - Geospatial Raster Analysis Credit Hours: 4
GIS 316 - Geospatial Vector Analysis I Credit Hours: 4
GIS 332 - Customizing the GIS Environ I Credit Hours: 4
GIS 426 - Geospatial Vector Analysis II Credit Hours: 4
GIS 432 - Customizing the GIS Envirn II Credit Hours: 4
GIS 446 - GIS Database Development Credit Hours: 4
GIS 456 - GIS Web Services & Management Credit Hours: 3
GME 161 - Plane Surveying I Credit Hours: 4
GME 425 - Remote Sensing Credit Hours: 4
MATH 252 - Integral Calculus Credit Hours: 4
MATH 362 - Statistical Methods II Credit Hours: 4
PHY 107, PHY 207, PHY 307, PHY 407
PHY 222 - General Physics w/Calculus Credit Hours: 4
PHY 223 - General Physics w/Calculus Credit Hours: 4

Applied Physics Minor

Students wishing to pursue the minor in Applied Physics should consult with physics faculty in the Natural Sciences Department for advising.
The Minor in Applied Physics is available to any student and is especially recommended for individuals interested in pursuing careers or graduate studies in physical or applied sciences and engineering. The Minor in Applied Physics requires completion of 32 credits of coursework as outlined below. A grade of "C" or better is required in all courses applied toward the minor.

Required Coursework:

PHY 221 - General Physics w/Calculus Credit Hours: 4
PHY 222 - General Physics w/Calculus Credit Hours: 4
PHY 223 - General Physics w/Calculus Credit Hours: 4
MATH 254 - Vector Calculus I Credit Hours: 4
MATH 321 - Appl Diff Equation I Credit Hours: 4
At least 12 credits of upper-division physics Electives (PHY prefix)

Approved Upper-Division Electives:
Up to six credits of the upper-division elective coursework may be satisfied by approved non-PHY electives that utilize the technical application of physics (see list below; other courses must be approved by the physics faculty and the chair of the Natural Sciences department on a case-by-case basis). Of the 12 upper-division elective credits, six cannot be counted toward the student's major program.

Any course 300-level or higher that has a PHY prefix.

Examples include:
PHY 311 - Intro to Modern Physics Credit Hours: 3
PHY 330 - Electricity & Magnetism Credit Hours: 3
PHY 448 - Geometric Optics Credit Hours: 4
PHY 449 - Radiometry & Optical Detect Credit Hours: 4
PHY 450 - Physical Optics Credit Hours: 4
PHY 451 - Lasers Credit Hours: 4
PHY 452 - Waveguides and Fiber Optics Credit Hours: 4
PHY 453 - Optical Metrology Credit Hours: 4
PHY 410 - Math Meth: Fourier Optics Credit Hours: 3

Approved non-PHY Electives:
EE 341 - Electricity/Magnetism w/Transm Credit Hours: 4
EE 343 - Solid State Electronic Devices Credit Hours: 3
REE 344 - Nuclear Energy Credit Hours: 3
REE 345 - Wind Power Credit Hours: 3
REE 347 - Hydroelectric Power Credit Hours: 3
MECH 312 - Dynamics II Credit Hours: 3
MECH 318 - Fluid Mechanics Credit Hours: 4
MECH 323 - Heat Transfer I Credit Hours: 3
MECH 417 - Fluid Mechanics II Credit Hours: 3
MECH 480 - Mechanical Vibrations Credit Hours: 3
MECH 313 - Thermodynamics II Credit Hours: 3

Note: Not all courses are offered every year or on every campus. Additional prerequisites may be required; see catalog descriptions and recent course schedules for details.

Biology Minor

For advising, see Lloyd Parratt

The biology minor is open to all majors except Biology-Health Sciences majors. It is especially recommended for students who want to further their knowledge in biology as it relates to their chosen field. The minor offers specialized courses in biology and will document student proficiency in specific areas of biology. A minimum of 24 credits is required to complete the minor. Any substitution for elective courses must be approved by an advisor in the Natural Sciences Department. Students are advised to pay strict attention to prerequisites when selecting courses for the biology minor.

Requirements of Minor

Required Core Courses:
BIO 211 - Principles of Biology Credit Hours: 4
BIO 212 - Principles of Biology Credit Hours: 4
BIO 213 - Principles of Biology Credit Hours: 4

And a minimum of 12 credits upper-division course work from the following list:
[a] Courses offered in alternating years.
BIO 313 - Botany Credit Hours: 4 [a]
BIO 331 - Human Anatomy/Physiology I Credit Hours: 5
BIO 332 - Human Anatomy/Physiology II Credit Hours: 5
BIO 333 - Human Anatomy/Physiology III Credit Hours: 5
BIO 337 - Aquatic Ecology Credit Hours: 4 [a]
BIO 341 - Medical Genetics Credit Hours: 3
BIO 342 - Cell Biology Credit Hours: 4
BIO 345 - Medical Microbiology Credit Hours: 5
BIO 352 - Developmental Biology Credit Hours: 4
BIO 357 - Intro to Neuroscience Credit Hours: 3
BIO 426 - Evolutionary Biology Credit Hours: 3
BIO 436 - Immunology Credit Hours: 4

Chemistry Minor

For advising, see Addie Clark

Oregon Tech offers a minor in chemistry to students in all majors interested in deepening their knowledge of chemistry, the "central science". A minor in chemistry allows students the opportunity to gain understanding of chemical phenomena, become proficient in techniques, and develop their abilities applying fundamental chemistry concepts to more complex problems in fields from medicine to renewable energy to materials science. A chemistry minor can help prepare students for graduate school, medical school, or professional laboratory or research work.

The minor includes a required core of one year of general chemistry and one term of organic chemistry. Students must then choose 16 credits of chemistry electives to complete the minor. Of these electives, 12 must be upper-division and at least 8 must be CHE courses. A minimum of 16 credits applied towards the minor must be earned at Oregon Tech.

Students wishing to pursue the minor in chemistry should consult with both their primary academic advisor and a chemistry minor advisor.

Requirements of Minor

Required Core Courses (17 - 19 credits):

CHE 201 - General Chemistry I Credit Hours: 3
CHE 204 - General Chemistry I Lab Credit Hours: 1
or
CHE 221 - General Chemistry I Credit Hours: 5

CHE 202 - General Chemistry II Credit Hours: 3
CHE 205 - General Chemistry II Lab Credit Hours: 1
or
CHE 222 - General Chemistry II Credit Hours: 5

CHE 203 - General Chemistry III Credit Hours: 3
CHE 206 - General Chemistry III Lab Credit Hours: 1
or
CHE 223 - General Chemistry III Credit Hours: 5

CHE 331 - Organic Chemistry I Credit Hours: 4

Elective Courses

(16 credits required; at least 12 must be upper division (300-level or higher) and at least 8 must be CHE courses) At least 6 elective credits must not be counted towards a major (or another minor or program) as required courses or technical electives:

CHE 260 - Electrochemistry for RE applic Credit Hours: 4

CHE 305 - Nanoscience & Nanotech Credit Hours: 4
or
ENGR 305 - Nanoscience & Nanotech Credit Hours: 4
or
PHY 305 - Nanoscience & Nanotech Credit Hours: 4

CHE 315 - Environmental Chem/Toxicology Credit Hours: 3
CHE 332 - Organic Chemistry II Credit Hours: 4
CHE 333 - Organic Chemistry III Credit Hours: 4
CHE 450 - Biochemistry I Credit Hours: 4
CHE 451 - Biochemistry II Credit Hours: 4
CHE 452 - Biochemistry III Credit Hours: 4
CHE 465 - Fate/Transport of Pollutants Credit Hours: 4
EE 343 - Solid State Electronic Devices Credit Hours: 3
ENGR 355 - Thermodynamics Credit Hours: 3
MECH 360 - Engineering Materials II Credit Hours: 3
MECH 260 - Engineering Materials I Credit Hours: 3
MLS 415 - Clinical Chemistry I Credit Hours: 6
MLS 416 - Clinical Chemistry II Credit Hours: 6
MLS 417 - Clinical Chemistry III Credit Hours: 2
PHY 311 - Intro to Modern Physics Credit Hours: 3
REE 331 - Fuel Cells Credit Hours: 3
REE 333 - Batteries Credit Hours: 3
REE 335 - Hydrogen Credit Hours: 3
REE 337 - Materials for RE Applications Credit Hours: 3
REE 346 - Biofuels and Biomass Credit Hours: 3
Any other CHE course at the 200-level or higher, except for pharmacology courses (CHE 210, CHE 350, CHE 360)
Other electives approved by the Natural Sciences department.

Coaching Minor

The Coaching Minor offers Oregon Tech students the opportunity to gain knowledge and skills in coaching. The Coaching Minor features study in the basics of sports medicine, team communication and psychology, and coaching theory. It also includes an opportunity to apply that knowledge to coaching in practical ways. Students who obtain the minor will document their preparation to coach in any sport or situation. For advising or for more information contact the head of the Coaching Minor Committee, currently, Dr. Kevin Brown.

Career Opportunities

The Coaching Minor represents a credential that documents the student's academic and practical preparation to coach. For students interested in coaching, this should give them an advantage over others without documented training and experience.

Requirements of the Minor

It is strongly recommended that students interested in obtaining this minor see a Coaching Minor advisor prior to taking courses.

HED 275 - Intro to Sports Medicine Credit Hours: 3
PSY 376 - Foundations of Sports Psych Credit Hours: 3
SPE 321 - Small Group/Team Comm Credit Hours: 3
PHED 255 - Intro to Coaching Theory Credit Hours: 3
PHED 355 - Coaching in Application Credit Hours: 3
PHED 455 - Coaching Practicum Credit Hours: 3

And six credits of PHED practice courses:

Athletic Conditioning

Choose 3 credits from the following courses:
PHED 102 - Zumba Credit Hours: 1
PHED 110 - Boot Camp/Kick Boxing Credit Hours: 1
PHED 111 - Core Strength and Balance Credit Hours: 1
PHED 112 - Intro to Cardio and Core Credit Hours: 1
PHED 113 - Super Circuit/Cardio Training Credit Hours: 1
PHED 120 - Pilates and Body Pump Credit Hours: 1
PHED 121 - Total Fitness Conditioning I Credit Hours: 1
PHED 122 - Total Fitness Conditioning II Credit Hours: 1
PHED 123 - Dancercise/Step Aerobics Credit Hours: 1
PHED 125 - Weight Management Fitness Credit Hours: 1
PHED 126 - Body Pump & Core Ball Pilates Credit Hours: 1

PHED 146 - Yoga Credit Hours: 1
or
PHED 188 - Varsity Sport/Strength Cond Credit Hours: 1

Sport Activity

Choose 3 credits from the following courses:
PHED 100 - Belly Dance: Beginning Credit Hours: 1
PHED 101 - Belly Dance: Intermediate Credit Hours: 1
PHED 125 - Weight Management Fitness Credit Hours: 1
PHED 130 - Rowing Credit Hours: 1
PHED 131 - Scuba: Beginning Credit Hours: 2
PHED 132 - Scuba: Advanced Credit Hours: 2
PHED 141 - Tai Chi for Circulation Credit Hours: 1
PHED 142 - Tai Chi for Internal Organs Credit Hours: 1
PHED 143 - Tai Chi & Qigong: Hlth,Bns, Mu Credit Hours: 1
PHED 144 - Tai Chi & Qigong: Neck/Back St Credit Hours: 1

PHED 145 - Relaxation and Flexibility Credit Hours: 1
PHED 150 - Aikido Credit Hours: 1
PHED 151 - Karate Credit Hours: 1
PHED 160 - Cross Country Skiing: Begin Credit Hours: 1
PHED 161 - Snowshoeing: Beginning Credit Hours: 1
PHED 162 - Ice Skating Credit Hours: 1
PHED 163 - Wilderness Navigation Credit Hours: 1
PHED 170 - Golf Credit Hours: 1
PHED 171 - Archery: Beginning Credit Hours: 1
PHED 172 - Archery: Intermediate Credit Hours: 1
PHED 174 - Recreational Basketball Credit Hours: 1
PHED 175 - Rugby Credit Hours: 1
PHED 180 - Varsity Cross Country Credit Hours: 1
PHED 181 - Varsity Soccer Credit Hours: 1
PHED 182 - Varsity Track/Field Credit Hours: 1
PHED 183 - Varsity Men's Baseball Credit Hours: 1
PHED 184 - Varsity Men's Basketball Credit Hours: 1
PHED 185 - Varsity Women's Basketball Credit Hours: 1
PHED 186 - Varsity Women's Softball Credit Hours: 1
PHED 187 - Varsity Women's Volleyball Credit Hours: 1
PHED 201 - Sports Seminar: Officiating Credit Hours: 2

Note: Requirements constitute 24 credits, of which 12 credits are upper division.

Sustainability Minor

For advising, see Jherime Kellerman, Environmental Sciences

The sustainability minor is available to all students in all majors and is recommended for any student who wants to develop sustainability literacy and gain credit for a breadth of study encompassing the three primary cores of sustainability education: natural sciences, humanities and social sciences, and engineering and technology. The minor in sustainability acknowledges the completion of 18 credits as outlined below. Introductory and capstone courses are included and at least one course must be taken in each of the three core areas. At least 12 of the 18 credits must be upper division. Advising for the minor is performed by a primary advisor with support from secondary advisors representing each of the three core areas.

Requirements of Minor

Required Core Courses (7 credits):

ENV 484 - Sustainable Human Ecology Credit Hours: 4
SOC 235 - Intro to Sustainability Credit Hours: 3

Elective Courses
(At least 11 credits required with at least one course taken from each area: natural sciences, humanities and social sciences, and engineering and technology):

Natural Sciences
ENV 111 - Intro to Env Sciences Credit Hours: 4
BIO 337 - Aquatic Ecology Credit Hours: 4
CHE 260 - Electrochemistry for RE Applic Credit Hours: 4
CHE 315 - Environmental Chem/Toxicology Credit Hours: 3
CHE 465 - Fate/Transport of Pollutants Credit Hours: 4
ENV 265 - Field Methods Environ Science Credit Hours: 3
ENV 314 - Env. Science, Law, & Policy Credit Hours: 3
ENV 336 - Environmental Hydrology Credit Hours: 4
ENV 365 - Adv Field Methods in Env Sci Credit Hours: 3
ENV 427 - Greenhouse Gas Accounting/Footprints Credit Hours: 3
ENV 469 - Treatment Wetlands Credit Hours: 3
GEOG 105 - Physical Geography Credit Hours: 4
Other courses as approved by the advisory team

Humanities and Social Sciences
ANTH 335 - The Built Environment Credit Hours: 3
ANTH 452 - Globalization Credit Hours: 3
COM 205 - Intercultural Comm Credit Hours: 3
COM 365 - Electronic Comm & Society Credit Hours: 3
ECO 357 - Energy Economics & Policy Credit Hours: 3
GEOG 106 - Cultural Geography I Credit Hours: 3
GEOG 107 - Cultural Geography II Credit Hours: 3
GEOG 108 - Cultural Geography III Credit Hours: 3
HIST 225 - Tech & Rise of the West Credit Hours: 3
HIST 226 - Tech & Modern World Credit Hours: 3
HIST 356 - A History of Energy Credit Hours: 3
HIST 357 - History of the Electric Grid Credit Hours: 3
HUM 125 - Intro Tech, Soc, Value Credit Hours: 3
PHIL 331 - Ethics in the Professions Credit Hours: 3
PHIL 342 - Business Ethics Credit Hours: 3
PSY 334 - Behavior Modification I Credit Hours: 4
Other courses as approved by advisory team

Engineering and Technology
BUS 385 - Ecotourism Credit Hours: 3
CE 405 - Sustainability & Infrastruct Credit Hours: 3
CE 457 - Transportation & Land Dev. Credit Hours: 3
CE 481 - Environmental Engineering I Credit Hours: 3
CE 489 - Treatment Wetlands Credit Hours: 3
CE 586 - Water & Wastewater Treatment Credit Hours: 4
GIS 134 - Geographic Info Systems Credit Hours: 3
GIS 103 - The Digital Earth Credit Hours: 3
MET 416 - Energy Systems Credit Hours: 3
REE 201 - Intro to Renewable Energy Credit Hours: 3
REE 253 - Electromech Energy Conversion Credit Hours: 3
REE 331 - Fuel Cells Credit Hours: 3
REE 346 - Biofuels and Biomass Credit Hours: 3
REE 427 - Greenhouse Gas Acct/Footprints Credit Hours: 3
Other courses as approved by the advisory team

Nursing

Susan Bakewell-Sachs, *School of Nursing Dean and Vice President for Nursing Affairs for OHSU*
Tamara Rose, *Campus Associate Dean*
Instructors: S. Brandsness, L. Callahan, L. Gimple, M. Gran-Moravec, D. Mize, C. Neubauer, C. VanDerWeide

This program is offered at Oregon Institute of Technology by the Oregon Health & Science University School of Nursing, in cooperation with Oregon Tech.

Degree Offered

- Bachelor of Science with a major in Nursing

The OHSU School of Nursing is a health professions leader in academic productivity and innovative educational programming. It is recognized as a model in educating students for careers in nursing at both the graduate and undergraduate levels. In July 1993, the Nursing Program at Oregon Tech became a member of the Statewide Integrated Nursing Education System for Oregon. Campuses are located in: Ashland, at Southern Oregon University; Klamath Falls, at Oregon Institute of Technology; La Grande, at Eastern Oregon University; Monmouth, at Western Oregon University; and Portland, at Oregon Health & Science University. In addition to a basic baccalaureate degree in nursing, the statewide program offers opportunities for RNs seeking B.S. degrees.

Non-nursing coursework may be taken at Oregon Institute of Technology, a community college, or other accredited institutions of higher learning. Pre-nursing majors must apply and be accepted by the OHSU School of Nursing in order to progress into the nursing major. Admission is dependent on a point system which includes academic performance, application essays, and on-site interviews if invited.

The baccalaureate in Nursing Program provides the essential foundation for professional nursing licensure and practice. The Nursing Program, as of fall 2006, includes one year (if courses are begun in summer term, or having transfer credits) or two years of pre-nursing courses and then, after acceptance into the program, three years of professional nursing courses and general courses, as well. Selection into the professional program is competitive.

Nursing courses build upon and complement the liberal arts and science foundation required for professional practice. The graduate of the B.S. program is eligible to complete the registered nursing licensure examination and is prepared to assume responsibility for providing professional nursing care.

Options for Registered Nurses to Obtain a B.S.

There is a process in place for assisting RNs to complete coursework to obtain a B.S. This is an online degree and is not offered on the Oregon Tech campus. Please contact the School of Nursing for information at (866) 223-1811.

Approval and Accreditation

The Nursing Program is approved by the Oregon State Board of Nursing (OSBN) and accredited by the Commission on Collegiate Nursing Education (CCNE) through 2023.

Admission

To be considered for admission to the School of Nursing, a student must submit an online application and official transcripts (www.ohsu.edu/son). The application process begins October 1 through February 15. The minimum criteria to apply are:

- have 30 credits of prerequisite courses completed by the end of fall term
- have completed the Human Anatomy and Physiology I
- be at the Intermediate Algebra math level
- have a minimum 3.0 GPA for your prerequisite courses

Transfer Credits

Transfer credits are accepted subject to review by OHSU Registrar's office for comparability and number of credits which may be granted.

Requirements for Major

Students with a baccalaureate degree in another discipline should see a nursing advisor for requirements with the nursing major.

Nursing, BS

Curriculum

Courses and terms during which they may be taken.

Pre-Nursing

Freshman Year Summer

SPE 111 - Public Speaking Credit Hours: 3 [c]
WRI 121 - English Composition Credit Hours: 3
Humanities Elective Credit Hours: 3
Social Science Elective Credit Hours: 3
Elective Credit Hours: 3
Total: 15 Credit Hours

Fall
BIO 231 - Human Anatomy/Physiology I Credit Hours: 4
MATH 100 - Intermediate Algebra Credit Hours: 4 [a]
PSY 201 - Psychology Credit Hours: 3
WRI 122 - Argumentative Writing Credit Hours: 3
Elective Credit Hours: 1-3
Total: 15+ Credit Hours

Winter
BIO 105 - Microbiology Credit Hours: 4
BIO 232 - Human Anatomy/Physiology II Credit Hours: 4
PSY 311 - Human Growth & Dev I Credit Hours: 3

WRI 123 - Research Writing Credit Hours: 3
or
WRI 227 - Technical Report Writing Credit Hours: 3
Total: 14 Credit Hours

Spring
BIO 205 - Nutrition Credit Hours: 3
BIO 233 - Human Anatomy/Physiology III Credit Hours: 4
PSY 312 - Human Growth & Dev II Credit Hours: 3
Elective Credit Hours: 3
Total: 13 Credit Hours

[a] The math competency may be demonstrated by a math placement test or by successful completion of MATH 95/MATH 100 Intermediate Algebra or higher
[b] Introductory Statistics is a nursing degree requirement
[c] SPE 111 is a prerequisite to the third writing (WRI 123 or WRI 227) course which is a degree requirement

Professional Courses

Sophomore Year Fall

NRS 210A - Foundations of Nursing - Health Promotion Credit Hours: 4
NRS 210B - Foundations Practicum Credit Hours: 5
Total: 9 Credit Hours

Winter
NRS 211 - Foundations of Nursing in Chronic Illness I Credit Hours: 6
NRS 230 - Pharmacology I Credit Hours: 3
NRS 232 - Pathophysiology I Credit Hours: 3
Total: 12 Credit Hours

Spring
NRS 212 Foundations of Nursing in Acute Care I Credit Hours: 6
NRS 231 Pharmacology II Credit Hours: 3
NRS 233 Pathophysiology II Credit Hours: 3
Total: 12 Credit Hours

Junior Year Fall
BIO 235 - Human Genetics Credit Hours: 3
NRS 322 - Nursing in Acute Care II and End-of-Life Credit Hours: 9
Total: 12 Credit Hours

Winter
MATH 243 - Introductory Statistics Credit Hours: 4 [a]
NRS 321 - Nursing in Chronic Illness II and End-of-Life Credit Hours: 9
Total: 13 Credit Hours

Spring
NRS 410 - Population-Based Chronic Illness and Health Promotion Credit Hours: 9
NRS 411 - Epidemiology Credit Hours: 3
Total: 12 Credit Hours

Senior Year Fall
NRS 412 - Leadership, Outcome Management in Nursing Credit Hours: 10
Elective Credit Hours: varies
Total: 10+ Credit Hours

Winter
NRS 424 - Integrative Practicum I Credit Hours: 9
NRS 424J - "J" Course Credit Hours: 1
Elective Credit Hours: varies
Total: 10+ Credit Hours

Spring
NRS 425 - Integrative Practicum II Credit Hours: 9
NRS 425J - "J" Course Credit Hours: 1
Elective Credit Hours: varies
Total: 10+ Credit Hours

[a] MATH 243 may be taken any term

Respiratory Care and Sleep Health

Jeff Pardy, *Department Chair*
Jeff Pardy, *Program Director, Respiratory Care, Oregon Tech Online*
Michael Schwartz, *Program Director, Sleep Health*
Sarah Fitzpatrick, *Program Director, Respiratory Care, Klamath Falls*
Michael Blumhardt, *Medical Director*
Mike Gilinsky, *Clinical Director, Respiratory Care*
Participating Faculty: L. McLaughlin, J. Perri, K. Rabe, M. Schwartz, J. Shinn, A. Venes, B. Westling
Adjunct Faculty: S. O'Keefe

Respiratory Care Program

Degree Offered

- Bachelor of Science in Respiratory Care

The Bachelor of Science degree program prepares the respiratory care student for entry into the respiratory care profession and eligibility for the National Board for Respiratory Care (NBRC) certificate examination (CRT) and registry examinations (RRT). Upon successful completion of the program, the graduate is eligible to apply for state licensure.

Accreditation

The Respiratory Care Program is fully accredited by the Commission on Accreditation for Respiratory Care (www.coarc.com), 1248 Harwood Rd., Bedford, TX 76021, (817) 283-2835.

Career Opportunities

Registered respiratory therapists are physician extenders who, under medical direction, administer cardiopulmonary care, evaluate and assess pulmonary patients, and administer medications and diagnostic tests when appropriate. Their duties involve the use of many of the latest advances in medical arts, sciences, and technology. Graduates are employed in hospitals, physician's offices, rehabilitation facilities, home-care agencies and health care promotion centers as caregivers, managers and educators.

Licensure

Students, when applying for licensure, will be asked if they have ever been convicted of a criminal offense, or if they have a history of drug or alcohol abuse. Students with a concern in this area should immediately contact the Oregon Respiratory Therapist Licensing Board (ORTLB) prior to applying to this program.

Program Objectives

Upon completion of the program, graduates will demonstrate:

1. Professional behavior consistent with employer expectations as advanced level respiratory therapists (affective domain).
2. The ability to comprehend, apply and evaluate clinical information relevant to their roles as advanced-level respiratory therapists (cognitive domain).
3. The technical proficiency in all the skills necessary to fulfill their roles as advanced level respiratory therapists (psychomotor domain).

Expected Program Learning Outcomes

Students in the program will demonstrate:

- the ability to communicate effectively in oral, written and visual forms
- knowledge of the respiratory care code of ethics and ethical and professional conduct
- the ability to function effectively as a member of the health care team
- knowledge and application of mechanical ventilation and therapeutics
- knowledge and application of cardiopulmonary pharmacology and pathophysiology
- management of respiratory care plans for adult, neonatal and pediatric patients

Pre-Respiratory Care Freshman Year

Enrollment is open to all students who meet the general entry requirements to Oregon Institute of Technology. Students will be listed as Pre-Respiratory Care students. Students will be selected into the professional curriculum based on cumulative grade-point average, non-smoking status, performance on an anatomy and physiology test and submission of a technical paper. Alternatively, students may be admitted based upon successful completion of a CoARC accredited associate degree program in respiratory care.

Students are strongly advised to complete all the general education courses in the freshman year curriculum before making application to the professional program.

Selections will be made at the end of the spring and summer terms of the Pre-Respiratory Care year. The number of students selected each year will be determined by the availability of clinical sites and other resources, which means that the number of qualified applicants may exceed the number of spaces available. When that is the case, students with the highest cumulative GPA are the first to be offered a position in the program.

Degree Completion Program

The Respiratory Care Program offers a degree completion program for respiratory therapists who wish to pursue a bachelor's degree in their field. The program is offered online and requires collaborative learning. Admission is based on successful completion of a CoARC accredited associate degree in respiratory care. When students have completed RCP 442 and have submitted documentation of the Registered Respiratory Therapist credential college credit is granted. Students must participate in an orientation. Each prospective student's academic credits will be individually evaluated to determine

acceptability of the non-professional coursework and the sequencing of the professional courses. Every student must meet the Oregon Tech general education requirements for graduation. The Respiratory Care Degree Program includes the presentation of a senior project.

Graduation Requirements
All credits listed in the curriculum for the catalog year a student begins a program must be fulfilled. A minimum of 187 credits must be completed and students must maintain a 2.00 GPA to be eligible for graduation. In addition, a final grade of "C" or better must be earned in all professional courses (RCP), communication courses, and science/mathematics courses to continue in the program. All curricular requirements must be met within five academic years once the student is admitted into the professional program as a sophomore. Students must successfully pass the SAE examination as a condition of the BS degree completion.

Clinical Sleep Health
Degree Offered
- Associate of Applied Science in Sleep Health, Clinical Sleep Health Option

Certificate Offered in Clinical Sleep Health
Students must successfully complete the core courses required to sit for a national exam. Computer and Internet access is required. Successful completion of the certificate curriculum (together with a completed Associate degree) leads to eligibility to sit for the national Certified Clinical Sleep Health examination (CCSH).

The program objectives and focus are to provide content knowledge in the following domains: Sleep Over the Lifespan; Clinical Evaluation and Management; Patient and Family Communication and Education; and Program Maintenance and Administration.

Associate of Applied Science in Sleep Health – Clinical Sleep Health Options
Students must successfully complete the courses in the certificate program for Clinical Sleep Health and 46 other general education credits. The degree completion courses can be taken from Oregon Tech or transferred from another college, however at least 30 credits must be taken from Oregon Tech. Successful completion of the two year curriculum leads to eligibility to sit for the national Certified Clinical Sleep Health (CCSH) exam. Computer and Internet access is required.

Students who have completed the CCSH exam may pursue a Health Care Management, Clinical Option, BS . Students complete health management classes offered through the Oregon Tech Management Department either in the classroom or via the online education program while working in their hometown. See the Management Department section of this catalog for more information regarding this degree.

Accreditation
The Clinical Sleep Health Program is accredited under the university accreditation by the Northwest Commission on Colleges and Universities (NWCCU), 8060 165th Avenue, N.E., Suite 100, Redmond, WA 98052-3981. NWCCU is an institutional accrediting body recognized by the Council for Higher Education and/or the Secretary of the U.S. Department of Education. As of this date, Commission on Accreditation of Allied Health Education Programs (CAAHEP) does not have an accrediting body for this degree.

Career Opportunities
Certified Clinical Sleep Health specialists, under medical direction, conduct diagnostic testing, evaluation of sleep disorder patients, patient/community education, compliance certification, status evaluations, and coordination of patient care plans. Their duties involve the use of highly advanced technology and compassionate patient care. Graduates are employed by hospitals, out-patient testing facilities and bio-medical equipment manufacturers.

Licensure
Students are eligible to sit for the national CCSH exam administered by the Board of Registered Polysomnographic Technologists following the completion of the courses in the certificate program.

Student Preparation
The Certificate in Clinical Sleep Health is designed for those who have an approved medical license and at least an associate degree. Applicants must have one of the following credentials to be eligible for admission into the certificate program.

- Polysomnographic Technologist (RPSGT) or
    - Sleep Technologist (RST)
    - Respiratory Therapist (RRT, CRT)
    - Neurodiagnostic Technologist (REEGT, CLTM)
- Health Educator (CHES)
- Nurse (RN, LPN, MSN) or
- Nurse Practitioner (NP)
- Physician (MD, DO)
- Physician Assistant (PA)
- Dentist (DDS)
- Dental Hygiene (DH)
- Doctor of Philosophy (PhD) in health, counseling, science

The AAS degree is for those who hold a current license in any of the above areas, but do not have an associate (or higher) degree. Candidates for the national registry exam must hold a minimum of an associate degree.

Computer Proficiency Requirement

The CSH Program is an online education program requiring basic computer proficiency to be successful.

Clinical Requirements

All applicants must meet the general admissions requirements to enroll in the Polysomnographic Technology Program. To be eligible for admission into the Polysomnographic Technology Program, applicants must meet the following criteria:

1. Applicants for the certificate program must be licensed in one of the medical fields listed above and hold at least an associate degree. **All prospective candidates must be currently employed in a facility that treats patients with sleep disorders, and the medical director or clinical manager must agree to allow the candidate to complete 400 hours of externship under his or her direction.**
2. Candidates must provide proof of completion of either a Cardio Pulmonary Resuscitation (CPR) course or a Basic Cardiac Life Support (BCLS) course prior to enrollment.

Graduation Requirements

Minimum graduation requirements for the A.A.S are the successful completion of 46 credit hours of general education courses and 45 credit hours in the area of specialization with a GPA of 2.0 or better. In addition, a final grade of "C" or better must be earned in all professional courses (CSH, BUS, and BIO), communication courses and science/mathematics course to continue in the program. This requirement also applies to the certificate program.

Polysomnographic Technology

Degree Offered

- Associate of Applied Science in Sleep Health

Certificate Offered

- Polysomnographic Technology

Students must successfully complete the core courses required to sit for a national exam. Computer and Internet access is required. Successful completion of the certificate curriculum leads to eligibility to sit for the national Registered Polysomnographic Technologists examination (RPSGT).

Associate of Applied Science in Sleep Health – Polysomnographic Technology Option

Students must successfully complete the courses in one of the certificate programs for Polysomnographic Technology or Clinical Sleep Health and other general education courses. The degree completion courses can be taken from Oregon Tech or transferred from another college. A minimum of 30 credit hours must be taken from Oregon Tech. Computer and Internet access are required.

Students who have completed the RPSGT or CCSH exams may pursue a Health Care Management, Clinical Option, BS . Students complete health management classes offered through the Oregon Tech Management Department either in the classroom or via the online education program while working in their hometown. See the Management Department for more information regarding this degree.

Accreditation

The Polysomnographic Technology Program is fully accredited by the Commission on Accreditation of Allied Health Education Programs (CAAHEP). The curriculum follows the guidelines suggested by the Board of Registered Polysomnographic Technologists. Inquiries regarding accreditation should be directed (CAAHEP). Commission on Accreditation of Allied Health Education Programs, (CoPSG) is a specialized accrediting body recognized by the Council for Higher Education Accreditation and/or the Secretary of the U.S., Department of Education. CAAHEP contact information: 1361 Park Street, Clearwater, FL 33756, Phone: (727) 210-2350

Career Opportunities

Registered Polysomnographic technologists, under medical direction, conduct diagnostic testing and evaluation of sleep disorder patients. Their duties involve the use of highly advanced technology and compassionate patient care. Graduates are employed by hospitals, out-patient testing facilities and bio-medical equipment manufacturers. Currently, there is a severe nationwide shortage of Registered Polysomnographic Technologists.

Licensure

Students are eligible to sit for the national RPSGT exam administered by the Board of Registered Polysomnographic Technologists following the completion of the courses in the certificate program.

Student Preparation

A science background is beneficial to those entering any health sciences profession. It is recommended that the student considering a career in Polysomnography take a college bound course of study in high school that includes algebra, chemistry and biology or human anatomy and physiology. It is recommended that students take courses in Microsoft Word, Excel and PowerPoint in high school. Students are required to provide proof of completion either Cardio Pulmonary Resuscitation (CPR) or Basic Cardiac Life Support (BCLS) prior to admission.

Computer Proficiency Requirement

Demonstrated computer proficiency is required by the Board of Registered Polysomnographic Technologists to be eligible to sit for the national exam. The PSG Program is an online education program requiring basic computer proficiency to be successful. Successful completion of the program therefore, indicates basic computer proficiency.

Degree Completion Program

The associate degree program offers a degree completion program for Registered Polysomnographic Technologists who lack a degree. The courses for this program can be taken through the Online Education Department or in the classroom. Two of the required courses are not available online and must

be taken either in the Oregon Tech classroom or a local college and transferred. The communication courses are offered through the online education program of other colleges in the Oregon University System.

Upon receipt of the necessary documentation, specific college credits will be awarded to qualified applicants for having passed the Registered Polysomnographic Technologists examination.

Clinical Requirements

All applicants must meet the general admissions requirements to enroll in the Polysomnographic Technology Program. To be eligible for admission into the Polysomnographic Technology Program, applicants must meet the following criteria:

1. Applicants for the certificate program must be high school graduates. If a prospective candidate is not currently employed in a sleep facility, an appropriate site must be found and a clinical agreement between Oregon Tech and that facility must be established prior to beginning classes.
2. Candidates must provide proof of completion of either a Cardio Pulmonary Resuscitation (CPR) course or a Basic Cardiac Life Support (BCLS) course prior to enrollment.
3. Candidates must submit immunization records prior to their clinical placement.
4. Criminal background clearance is required prior to acceptance and some clinical sites may require drug screening.
5. One full shift of job shadowing is required prior to applying to the program.
6. All Prospective candidates must speak with the program director Dr. Jane Perri, (937) 750-5416, prior to submitting their application

Graduation Requirements

Minimum graduation requirements for the A.A.S are the successful completion of 43 credit hours of general education courses and 47 credit hours in the area of specialization with a GPA of 2.0 or better. In addition, a final grade of "C" or better must be earned in all professional courses (PSG, ECHO, and RCP), communication courses and science/mathematics course to continue in the program. This requirement also applies to the certificate program.
In order to prepare for the national registry exam, students are required to participate in a practical exam and a comprehensive written exam at the conclusion of the certificate program. Students are required to come either to Medford Oregon or to Dayton, Ohio for one day of residency. Passage of these exams is required to complete the certificate program. Associate degree students who have already obtained their national licensure are not required to complete this requirement.

Respiratory Care, BS

Curriculum

Required courses and terms during which they may be taken.

Pre-Respiratory Care

Freshman Year Fall

BIO 231 - Human Anatomy/Physiology I Credit Hours: 4
CHE 101 - Intro to General Chemistry Credit Hours: 3
CHE 104 - Intro to General Chemistry Lab Credit Hours: 1

MATH 111 - College Algebra Credit Hours: 4
or
MATH 243 - Introductory Statistics Credit Hours: 4

WRI 121 - English Composition Credit Hours: 3
Total: 15 Credit Hours

Winter
BIO 232 - Human Anatomy/Physiology II Credit Hours: 4

PSY 201 - Psychology Credit Hours: 3
or
PSY 202 - Psychology Credit Hours: 3
or
PSY 203 - Psychology Credit Hours: 3

WRI 122 - Argumentative Writing Credit Hours: 3
Humanities Elective Credit Hours: 3
Social Science Elective Credit Hours: 3
Total: 16 Credit Hours

Spring
BIO 200 - Medical Terminology Credit Hours: 2
BIO 233 - Human Anatomy/Physiology III Credit Hours: 4
SPE 111 - Public Speaking Credit Hours: 3
Humanities Elective Credit Hours: 3
Social Science Elective Credit Hours: 3
Total: 15 Credit Hours

Summer
COM 205 - Intercultural Comm Credit Hours: 3
WRI 227 - Technical Report Writing Credit Hours: 3
Humanities Elective Credit Hours: 3
Social Science Elective Credit Hours: 3
Math/Science/Social Science Elective Credit Hours: 1
Total: 13 Credit Hours

Professional Courses

Sophomore Year Fall

BIO 336 - Essentials of Pathophysiology Credit Hours: 3
CHE 360 - Clinical Pharmacology/Hlth Prf Credit Hours: 3
RCP 100 - Matriculation Credit Hours: 2
RCP 231 - Pulmonary Physiology Credit Hours: 4
Total: 12 Credit Hours

Winter
BIO 105 - Microbiology Credit Hours: 4
RCP 235 - Arterial Blood Gases Credit Hours: 3
RCP 236 - Cardiopulmonary Dynamics Credit Hours: 3
RCP 241 - Respiratory Gas Therapeutics Credit Hours: 4
Total: 14 Credit Hours

Spring
RCP 223 - Emergent Chest Radio Interpret Credit Hours: 2
RCP 252 - Cardiopulmonary Pharmacology Credit Hours: 4
RCP 336 - Hyperinflation Therapies Credit Hours: 3
SPE 321 - Small Group/Team Comm Credit Hours: 3
Total: 12 Credit Hours

Junior Year Fall

RCP 337 - Pulmonary Pathology Credit Hours: 4
RCP 351 - Mechanical Ventilation I Credit Hours: 4
RCP 388 - Adv Neonatal Respiratory Care Credit Hours: 4
Total: 12 Credit Hours

Winter
RCP 352 - Mechanical Ventilation II Credit Hours: 4
RCP 375 - Pediatric Care Credit Hours: 4
RCP 386 - Critical Care I Credit Hours: 4
Total: 12 Credit Hours

Spring
RCP 326 - Preparedness, Ethics, and Leadership Credit Hours: 2
RCP 335 - Exercise Physiol and Education Credit Hours: 2
RCP 345 - Cardiopulmonary Diag & Monitor Credit Hours: 3
RCP 353 - Mechanical Ventilation III Credit Hours: 4
RCP 387 - Critical Care II Credit Hours: 2
Total: 13 Credit Hours

Senior Year Summer

RCP 350 - Introduction to Clinical Credit Hours: 9
RCP 366 - Clinical Simulation Credit Hours: 3
RCP 440 - Case Management I Credit Hours: 3
Total: 15 Credit Hours

Fall
RCP 441 - Case Management II Credit Hours: 3
RCP 450 - Clinical Care I Credit Hours: 9
Total: 12 Credit Hours

Winter
RCP 442 - Case Management III Credit Hours: 3
RCP 451 - Clinical Care II Credit Hours: 9
Total: 12 Credit Hours

Spring
RCP 452 - Clinical Care III Credit Hours: 12
RCP 460 - Advanced Life Support Credit Hours: 2
Total: 14 Credit Hours

Total for a B.S. in Respiratory Care: 187 Credit Hours

Respiratory Care, Degree Completion, BS

The Respiratory Care program offers a degree completion program for registered technologists in good standing, who wish to pursue a bachelor's degree in their field. The program is offered completely online. There is no on campus residency requirement.

Curriculum

Courses granted for Registered Respiratory Therapist (RRT)

RCP 223 - Emergent Chest Radio Interpret Credit Hours: 2
RCP 231 - Pulmonary Physiology Credit Hours: 4
RCP 235 - Arterial Blood Gases Credit Hours: 3
RCP 236 - Cardiopulmonary Dynamics Credit Hours: 3
RCP 241 - Respiratory Gas Therapeutics Credit Hours: 4
RCP 252 - Cardiopulmonary Pharmacology Credit Hours: 4
RCP 336 - Hyperinflation Therapies Credit Hours: 3
RCP 337 - Pulmonary Pathology Credit Hours: 4
RCP 350 - Introduction to Clinical Credit Hours: 9
RCP 351 - Mechanical Ventilation I Credit Hours: 4
RCP 352 - Mechanical Ventilation II Credit Hours: 4
RCP 386 - Critical Care I Credit Hours: 4
RCP 450 - Clinical Care I Credit Hours: 9
RCP 451 - Clinical Care II Credit Hours: 9
RCP 452 - Clinical Care III Credit Hours: 12
RCP 460 - Advanced Life Support Credit Hours: 2

Oregon Tech Degree Completion Courses

BIO 336 - Essentials of Pathophysiology Credit Hours: 3
CHE 360 - Clinical Pharmacology/Hlth Prf Credit Hours: 3
COM 205 - Intercultural Comm Credit Hours: 3
RCP 100 - Matriculation Credit Hours: 2
RCP 326 - Preparedness, Ethics, and Leadership Credit Hours: 2
RCP 335 - Exercise Physiol and Education Credit Hours: 2
RCP 345 - Cardiopulmonary Diag & Monitor Credit Hours: 3
RCP 353 - Mechanical Ventilation III Credit Hours: 4
RCP 366 - Clinical Simulation Credit Hours: 3
RCP 387 - Critical Care II Credit Hours: 2
RCP 388 - Adv Neonatal Respiratory Care Credit Hours: 4
RCP 440 - Case Management I Credit Hours: 3
RCP 441 - Case Management II Credit Hours: 3
RCP 442 - Case Management III Credit Hours: 3
SPE 321 - Small Group/Team Comm Credit Hours: 3
WRI 227 - Technical Report Writing Credit Hours: 3
Humanities Elective Credit Hours: 6
Social Science Elective Credit Hours: 6

Prerequisite/Transfer Courses

BIO 105 - Microbiology Credit Hours: 4
BIO 200 - Medical Terminology Credit Hours: 2
BIO 231 - Human Anatomy/Physiology I Credit Hours: 4
BIO 232 - Human Anatomy/Physiology II Credit Hours: 4
BIO 233 - Human Anatomy/Physiology III Credit Hours: 4
CHE 101 - Intro to General Chemistry Credit Hours: 3
CHE 104 - Intro to General Chemistry Lab Credit Hours: 1

MATH 111 - College Algebra Credit Hours: 4
or
MATH 243 - Introductory Statistics Credit Hours: 4

PSY 201 - Psychology Credit Hours: 3
or
PSY 202 - Psychology Credit Hours: 3
or
PSY 203 - Psychology Credit Hours: 3

SPE 111 - Public Speaking Credit Hours: 3
WRI 121 - English Composition Credit Hours: 3
WRI 122 - Argumentative Writing Credit Hours: 3
Humanities Elective Credit Hours: 3
Social Science Elective Credit Hours: 3
MATH/SCI/SS Elective Credit Hours: 1

Sleep Health, Clinical Sleep Health Option, AAS

Curriculum

All courses in the Certificate Program and all courses listed below are required to earn the A.A.S. degree:

BIO 231 - Human Anatomy/Physiology I Credit Hours: 4
BIO 232 - Human Anatomy/Physiology II Credit Hours: 4
BIO 233 - Human Anatomy/Physiology III Credit Hours: 4
MATH 243 - Introductory Statistics Credit Hours: 4

PSY 201 - Psychology Credit Hours: 3
or
PSY 202 - Psychology Credit Hours: 3
or
PSY 203 - Psychology Credit Hours: 3

SPE 111 - Public Speaking Credit Hours: 3
WRI 121 - English Composition Credit Hours: 3
WRI 122 - Argumentative Writing Credit Hours: 3
WRI 227 - Technical Report Writing Credit Hours: 3
Math/Science/Social Science Elective Credit Hours: 6
Humanities Elective Credit Hours: 3
Electives Credit Hours: 6
Total: 46 Credit Hours

Total for an A.A.S. Degree in Sleep Health, Option: Clinical Sleep Health: 91 Credit Hours
Clinical Sleep Health Certificate Courses Credit Hours: 45
Additional Courses Credit Hours: 46

Sleep Health, Polysomnographic Technology Option, AAS

Curriculum

All courses in the Certificate Program and all courses listed below are required to earn the A.A.S. degree:

Required Courses:

BIO 231 - Human Anatomy/Physiology I Credit Hours: 4
BIO 232 - Human Anatomy/Physiology II Credit Hours: 4
BIO 233 - Human Anatomy/Physiology III Credit Hours: 4
MATH 243 - Introductory Statistics Credit Hours: 4

PSY 201 - Psychology Credit Hours: 3
or
PSY 202 - Psychology Credit Hours: 3
or
PSY 203 - Psychology Credit Hours: 3

SPE 111 - Public Speaking Credit Hours: 3
WRI 121 - English Composition Credit Hours: 3
WRI 122 - Argumentative Writing Credit Hours: 3
WRI 227 - Technical Report Writing Credit Hours: 3
Math/Science/Social Science Elective Credit Hours: 6
Humanities Elective Credit Hours: 3
Electives Credit Hours: 3
Total: 43 Credit Hours

Total for an A.A.S. Degree Sleep Health Polysomnographic Technology Option: 90 Credit Hours
Polysomnographic Technology Certificate Courses Credit Hours: 45
Additional Courses Credit Hours: 43

Clinical Sleep Health Certificate

Curriculum

A certificate will be awarded to students completing 45 credit hours of course work in Clinical Sleep Health.

Required courses:
BIO 200 - Medical Terminology Credit Hours: 2
BUS 337 - Prin of Health Care Marketing Credit Hours: 3
BUS 317 - Health Care Management Credit Hours: 3
CSH 201 - Human Development and Sleep Health Credit Hours: 3
CSH 220 - Sleep Disord & Co-Morbid Credit Hours: 3
CSH 225 - Imp of Neuro Disord on Slp Credit Hours: 3
CSH 236 - Pharmacology of Sleep Credit Hours: 3
CSH 242 - Evaluation & Measurement Tools Credit Hours: 3
CSH 233 - Sleep Therapies & Compliance Credit Hours: 3
CSH 268 - Lrng, Hlth Lit, & Comm Edu Credit Hours: 3
CSH 276 - Capstone Project Credit Hours: 3
CSH 277 - Clinical Sleep Health Extern Credit Hours: 13 (400 contact hours)

Total for a Certificate in Clinical Sleep Health: 45 Credit Hours

Polysomnographic Technology Certificate

Curriculum

A certificate will be awarded to students completing 47 credit hours of course work in Polysomnography. This program is fully accredited by the Commission on Accreditation of Allied Health Education Programs (CAAHEP). Completion of the certificate will allow the graduate to sit for the national registry exam in Polysomnographic Technology.

Required Courses:
BIO 200 - Medical Terminology Credit Hours: 2
ECHO 227 - Basic ECG Recognition/Testing Credit Hours: 3
PSG 211 - Fund of PSG & Patient Care Credit Hours: 3
PSG 221 - Physiology of Sleep Credit Hours: 3
PSG 231 - Sleep Disorders Pathology Credit Hours: 4
PSG 246 - Sleep Disorders in Women Credit Hours: 3
PSG 264 - Pediatric/Neonatal Psg Credit Hours: 4

PSG 271A - Clinical Polysom Tech A Credit Hours: 6
PSG 271B - Clinical Polysom Tech B Credit Hours: 6
PSG 271C - Clinical Polysom Tech C Credit Hours: 6
or
PSG 272 - Clinical Polysomngphy Tech I Credit Hours: 9
PSG 273 - Clinical Polysomngrphy Tech II Credit Hours: 9

PSG 291 - Clinical Sleep Educator Credit Hours: 3
RCP 120 - Interventions in Gas Exchange Credit Hours: 4

Total for a Certificate in Polysomnographic Technology: 47 Credit Hours

Demonstrated computer proficiency is required by the Board of RPGST. After completion of the Web-based program, the student will have demonstrated computer proficiency.

The clinical Polysomnographic technology courses require placement in clinical sites. Students are responsible for selecting an accredited sleep disorder facility prior to admission into the program. Site agreements between Oregon Tech and the accredited facility must be in place for the student to begin these courses. On-site preceptors will work in conjunction with Oregon Tech faculty to ensure an excellent training experience.

Engineering, Technology and Management

Civil Engineering

Roger Lindgren, *Department Chair*
C.J. Riley, *Program Director, Master of Science in Civil Engineering*
Sean St.Clair, *Curriculum Coordinator*
Professors: R. Lindgren, C. Riley, S. St.Clair
Associate Professors: M. Sleep
Assistant Professors: E. Cox, A Greer

Civil engineers design infrastructure—transportation networks, bridges, buildings, dams, communities, and water and waste management systems—for the enhancement of human welfare and protection of our environment. Oregon Tech's freshman-to-master's Civil Engineering degree program, the first such program in the Pacific Northwest, equips students to meet industry needs identified by the American Society of Civil Engineers (ASCE).

Degrees Offered

- Master of Science in Civil Engineering
- Master of Science and Bachelor of Science in Civil Engineering (concurrent degree)
- Bachelor of Science in Civil Engineering

Career Opportunities

Upon completing the core curriculum, civil engineering students have a solid foundation in structural, transportation, water resources/ environmental, and geotechnical engineering. In their fourth and fifth years of study, students can then target specific careers with specialized technical electives. Graduates have career opportunities with consulting firms, government agencies, heavy construction contractors and industry.

Geotechnical engineering involves the design and construction of projects built on and of the earth. These projects include foundations for structures, earth embankments of soil and rock, dams, levees, and tunnels. In addition, geotechnical engineers predict reactions of the earth due to changes imposed by other engineered systems.

Structural engineering involves the planning, analysis and design of buildings and other structures using the principal construction materials of wood, steel, concrete and masonry. Graduates are familiar with current codes and standards, and are aware of trends in high-performance structures.

Transportation engineering is concerned with the planning, design, construction, operation, performance, evaluation and rehabilitation of transportation systems and facilities, such as streets, highways, bicycle and pedestrian facilities, railroads, mass transit, and air transportation systems.

Water resources and environmental engineering address the spectrum of water from supply to transport to use to discharge, and are at the junction of efforts to provide sustainable human and natural environments, in compliance with regulatory mandates. Graduates have opportunities in planning, design, and operation of hydraulic and water resource projects, floodplain management, or resource management issues.

Civil engineering graduates may consider a concurrent degree in environmental sciences to expand career opportunities with a broad spectrum of government agencies, consulting firms, and industry.

Mission Statement

The mission of the Oregon Tech Civil Engineering program is to prepare students for professional practice. To be prepared to practice as professionals, engineers must be able to act responsibly and ethically, understand their limits and the limits of the tools they use, communicate effectively, work well in teams, and, amid the changing landscape of the field of civil engineering, be able to pursue graduate-level education.

Objectives

Civil engineering graduates will be able to:

1. Practice as a professional civil engineer.
2. Pursue advanced education in civil engineering or related fields.
3. Act as responsible, effective and ethical citizens.
4. Understand and effectively communicate the realistic constraints of civil engineering.
5. Perform effectively in a multi-disciplinary environment.

Students enjoy a close relationship with full-time faculty with advanced engineering degrees who are also licensed professionals with many years of practical experience. Course offerings promote education in theory relevant to our civil engineering technical areas, engineering design and principles of sustainable development. These concepts are emphasized and integrated throughout the curriculum in a sequential manner.

Early in the curriculum, elements of the creative design process are introduced as students complete first-year design projects. While most freshman and sophomore courses are intended to provide a solid background in mathematics, communications, basic sciences, and engineering mechanics, certain courses provide additional concepts and methodologies supporting more advanced topics in engineering and professional practice.

At the junior level, students develop a broad civil engineering base. Junior courses include core topics in geotechnical, structural, transportation, and water resources engineering.

In the fourth year, students are required to complete an intensive engineering design project. This effort is focused on a professional-quality civil engineering design and includes essential elements of technical communications and group dynamics. The design project also involves realistic constraints including cost and sustainability considerations, socioeconomic concerns, aesthetic choices and ethical deliberations. Fourth-year students

prepare for the Fundamentals of Engineering (FE) examination as a first step toward licensure as professional engineers. In this year, concurrent (BS/MS) degree-seeking students also begin their selected program of graduate-level coursework leading to selection of their graduate project.

Finally, in the fifth year, concurrent students complete coursework and individual graduate projects leading to the concurrent bachelor's and master's degrees.

To ensure graduates become responsible, effective citizens and begin building a foundation for lifelong learning, students are required to satisfy Oregon Tech general education requirements in communication, humanities, social sciences, and science/mathematics.

Student Preparation

Students interested in the field of civil engineering should emphasize mathematics and science in high school. Two years of algebra and one year each of geometry, trigonometry, chemistry and physics are preferred. Additional courses in mathematics and computer-aided drafting are desirable.

Accreditation

The Civil Engineering Program is accredited by the Engineering Accreditation Commission (EAC) of ABET, Inc., 111 Market Place, Suite 1050, Baltimore, MD 21202-4012, telephone: (410) 347-7700. ABET is a specialized accrediting board recognized by the Council for Higher Education and/or the Secretary of the U.S. Department of Education.

Graduation Requirements

All courses listed in the curriculum for the current catalog year must be completed to be eligible for graduation, unless a student has already completed the requirements for a category that has changed. When changes are made to the curriculum, students who entered the program under a previous catalog will work with their academic advisors to transition to meet the requirements of the current catalog.

For the concurrent bachelor's and master's degrees in Civil Engineering, a minimum of 225 credits must be completed. Students must earn a 3.0 GPA by the end of the third year for progression to the fourth and fifth years of study. In addition, a final grade of "C" or better must be earned in all math and science courses and those with CE, ENGR, GIS, and GME prefixes, as well as all courses listed as prerequisites for these courses. At least 45 credits of graduate work must be completed. Students must maintain a 3.0 graduate-level GPA with a final grade of "C" or better in all graduate courses.

For the bachelor's degree in Civil Engineering, a minimum of 180 credits must be completed and students must maintain a 2.0 GPA to be eligible for graduation. In addition, a final grade of "C" or better must be earned in all math and science courses and those with CE, ENGR, GIS, and GME prefixes as well as all listed prerequisites for these courses.

The Master of Science in Civil Engineering requires completing 45 credits of approved graduate work. Students must maintain a 3.0 graduate-level GPA with a final grade of "C" or better in all graduate courses.

Civil Engineering, BS/MS

Curriculum

Required courses and recommended terms during which they should be taken:

Freshman Year Fall
CHE 221 - General Chemistry I Credit Hours: 5
ENGR 101 - Intro to Engineering I Credit Hours: 2
SPE 111 - Public Speaking Credit Hours: 3
WRI 121 - English Composition Credit Hours: 3
Humanities Elective Credit Hours: 3 [a]
Total: 16 Credit Hours

Winter
CHE 222 - General Chemistry II Credit Hours: 5
ENGR 102 - Intro to Engineering II Credit Hours: 2
WRI 122 - Argumentative Writing Credit Hours: 3
Literature Elective Credit Hours: 3
Social Science Elective Credit Hours: 3
Total: 16 Credit Hours

Spring
CE 203 - Engineering Graphics Credit Hours: 3
GEOL 201 - Physical Geology Credit Hours: 4
MATH 251 - Differential Calculus Credit Hours: 4
Humanities Elective Credit Hours: 3 [a]
Total: 14 Credit Hours

Sophomore Year Fall
CE 212 - Civil Engineering Materials Credit Hours: 4
GME 161 - Plane Surveying I Credit Hours: 4
MATH 252 - Integral Calculus Credit Hours: 4
PHY 221 - General Physics w/Calculus Credit Hours: 4
Total: 16 Credit Hours

Winter
ENGR 211 - Engineering Mechanics: Statics Credit Hours: 4
GIS 134 - Geographic Info Systems Credit Hours: 3
MATH 254 - Vector Calculus I Credit Hours: 4
WRI 227 - Technical Report Writing Credit Hours: 3
Total: 14 Credit Hours

Spring
CE 205 - Computational Methods Credit Hours: 2
ENGR 213 - Engr Mech: Strength of Mat Credit Hours: 4
MATH 321 - Appl Diff Equation I Credit Hours: 4

PHY 222 - General Physics w/ Calculus Credit Hours: 4
or
PHY 223 - General Physics w/ Calculus Credit Hours: 4
Total: 14 Credit Hours

Junior Year Fall
CE 311 - Intro to Geotechnical Engr Credit Hours: 5
CE 331 - Structural Analysis Credit Hours: 4
ENGR 318 - Engineering Mech: Fluids Credit Hours: 4
MATH 361 - Statistical Methods I Credit Hours: 4
Total: 17 Credit Hours

Winter
CE 308 - Princ of Professional Practice Credit Hours: 4
CE 341 - Elementary Structural Design Credit Hours: 5
CE 351 - Intro to Transportation Engr Credit Hours: 4
CE 371 - Closed Conduit Design Credit Hours: 4
Total: 17 Credit Hours

Spring
CE 312 - Earth Pressures & Foundations Credit Hours: 3
CE 354 - Traffic Engineering Credit Hours: 3
CE 374 - Hydrology Credit Hours: 4

CE 442 - Adv Reinforced Concrete Design Credit Hours: 4
or
CE 444 - Intermediate Steel Design Credit Hours: 4
Total: 14 Credit Hours

Fourth Year
CE 401/COM 401 - Civil Engineering Project I Credit Hours: 5
CE 402 - Civil Engineering Project II Credit Hours: 4
CE 405 - Sustainability & Infrastruct Credit Hours: 3
CE 501 - Civil Engr Graduate Seminar Credit Hours: 1
WRI 521 - Writing at the Grad Level Credit Hours: 3
Technical Electives Credit Hours: 3 [b]
Graduate Technical Electives Credit Hours: 12 [c]
MATH 4XX - Math/Science Elective Credit Hours: 3
Social Science Elective Credit Hours: 3
Social Science Elective Credit Hours: 3
SPE/WRI/COM Elective Credit Hours: 3
Year Total: 43 Credit Hours

Fifth Year
ANTH 452 - Globalization Credit Hours: 3
CE 590 - Civil Engineering Grad Project Credit Hours: 9
Technical Electives Credit Hours: 12 [b]
Graduate Technical Electives Credit Hours: 20-29 [c]
Year Total: 44 Credit Hours

Total Required for BS/MSCE: 225 Credit Hours

[a] No more than 3 credits of Humanities courses may be skill- or performance based.
[b] Technical electives are generally 400- and 500-level CE courses. A maximum of 2 non-CE technical elective courses (specified below) may be applied to the concurrent BSCE/MSCE degrees.
[c] Graduate technical electives are generally 500-level CE courses. At the discretion of the graduate advisor, up to 9 credits may be selected from 400-level CE and non-CE courses. Approved non-CE 500-level courses may be chosen as electives.

Allowed Non-CE Technical Electives

ENV 435 - Atmospheric Physics Credit Hours: 4

GME 351 - Constr/Engr Surveying Credit Hours: 3
or
GME 372 - Subdiv'n Planning and Platting Credit Hours: 3

GME 425 - Remote Sensing Credit Hours: 4
MATH 341 - Linear Algebra I Credit Hours: 4
MATH 451 - Numerical Methods I Credit Hours: 4
MATH 465 - Mathematical Statistics Credit Hours: 4

Civil Engineering, BS

Curriculum

Required courses and recommended terms during which they should be taken:

Freshman Year Fall
CHE 221 - General Chemistry I Credit Hours: 5
ENGR 101 - Intro to Engineering I Credit Hours: 2
SPE 111 - Public Speaking Credit Hours: 3
WRI 121 - English Composition Credit Hours: 3
Humanities Elective Credit Hours: 3 [a]
Total: 16 Credit Hours

Winter
CHE 222 - General Chemistry II Credit Hours: 5
ENGR 102 - Intro to Engineering II Credit Hours: 2
WRI 122 - Argumentative Writing Credit Hours: 3
Literature Elective Credit Hours: 3
Social Science Elective Credit Hours: 3
Total: 16 Credit Hours

Spring
CE 203 - Engineering Graphics Credit Hours: 3
GEOL 201 - Physical Geology Credit Hours: 4
MATH 251 - Differential Calculus Credit Hours: 4
Humanities Elective Credit Hours: 3 [a]
Total: 14 Credit Hours

Sophomore Year Fall
CE 212 - Civil Engineering Materials Credit Hours: 4
GME 161 - Plane Surveying I Credit Hours: 4
MATH 252 - Integral Calculus Credit Hours: 4
PHY 221 - General Physics w/Calculus Credit Hours: 4
Total: 16 Credit Hours

Winter
ENGR 211 - Engineering Mechanics: Statics Credit Hours: 4
GIS 134 - Geographic Info Systems Credit Hours: 3
MATH 254 - Vector Calculus I Credit Hours: 4
PHY 222 - General Physics w/Calculus Credit Hours: 4
Total: 15 Credit Hours

Spring
CE 205 - Computational Methods Credit Hours: 2
ENGR 213 - Engr Mech: Strength of Mat Credit Hours: 4
MATH 321 - Appl Diff Equation I Credit Hours: 4
WRI 227 - Technical Report Writing Credit Hours: 3
Total: 13 Credit Hours

Junior Year Fall
CE 311 - Intro to Geotechnical Engr Credit Hours: 5
CE 331 - Structural Analysis Credit Hours: 4
ENGR 318 - Engineering Mech: Fluids Credit Hours: 4
MATH 361 - Statistical Methods I Credit Hours: 4
Total: 17 Credit Hours

Winter
CE 308 - Princ of Professional Practice Credit Hours: 4
CE 341 - Elementary Structural Design Credit Hours: 5
CE 351 - Intro to Transportation Engr Credit Hours: 4
CE 371 - Closed Conduit Design Credit Hours: 4
Total: 17 Credit Hours

Spring
CE 312 - Earth Pressures & Foundations Credit Hours: 3
CE 354 - Traffic Engineering Credit Hours: 3
CE 374 - Hydrology Credit Hours: 4

CE 442 - Adv Reinforced Concrete Design Credit Hours: 4
or
CE 444 - Intermediate Steel Design Credit Hours: 4
Total: 14 Credit Hours

Senior Year
ANTH 335 - The Built Environment Credit Hours: 3
or
HIST 335 - Engineering Profession Credit Hours: 3

ANTH 452 - Globalization Credit Hours: 3
CE 401/COM 401 - Civil Engineering Project I Credit Hours: 5
CE 402 - Civil Engineering Project II Credit Hours: 4
CE 405 - Sustainability & Infrastruct Credit Hours: 3
Technical Electives Credit Hours: 15 [b]
Math/Science Elective Credit Hours: 3
Social Science Elective Credit Hours: 3
SPE/WRI/COM Elective Credit Hours: 3
Total: 42 Credit Hours

Total for a B.S. in Civil Engineering: 180 Credit Hours

[a] No more than 3 credits of Humanities courses may be skill- or performance based.
[b] Technical electives are generally 400- and 500-level CE courses. A maximum of 2 non-CE technical elective courses (specified below) may be applied to the BSCE degree.

Allowed Non-CE Technical Electives
ENV 314 - Env. Science, Law, & Policy 3
GME 351 - Constr/Engr Surveying 3
GME 372 - Subdiv'n Planning and Platting 3
GME 425 - Remote Sensing 4
MATH 341 - Linear Algebra I 4
MATH 452 - Numerical Methods II 4
MATH 465 - Mathematical Statistics 4

Civil Engineering, MS

Curriculum

For students who have previously completed a BSCE degree [e]
ANTH 452 - Globalization Credit Hours: 3
CE 501 - Civil Engr Graduate Seminar Credit Hours: 1
CE 590/595 - Graduate Project/Thesis Credit Hours: varies 0-12
MATH 4XX Credit Hours: 3
WRI 521 - Writing at the Grad Level Credit Hours: 3
Graduate Technical Electives Credit Hours: 23-35 [f]

Total for a M.S. in Civil Engineering: 45 Credit Hours

[e] Students with a BS degree in a closely-related field of study may be considered. These students will generally be required to complete additional course work.
[f] Graduate technical electives are generally 500-level CE courses. At the discretion of the graduate advisor, up to 9 credits may be selected from 400-level CE and non-CE courses. Approved non-CE 500-level courses may be chosen as electives.

Civil Engineering/Environmental Sciences, BS

Curriculum

Civil Engineering students have the opportunity to earn dual degrees in Civil Engineering and Environmental Sciences. The additional degree requires 53 credits in Environmental Sciences courses, which can be taken concurrent to Civil Engineering courses or as an add-on year. The dual degree in Environmental Sciences places engineering projects in the context of environmental impacts and environmental regulations, and expands the range of job opportunities for Oregon Tech Civil Engineering graduates. The purpose of the concurrent programs is to challenge motivated students to become even better prepared for the engineering and environmental job markets. To obtain both degrees, students must complete the following listed courses along with the courses required for the Bachelor of Science in Civil Engineering.

BIO 211 - Principles of Biology Credit Hours: 4
BIO 212 - Principles of Biology Credit Hours: 4
BIO 213 - Principles of Biology Credit Hours: 4
BIO 225 - Riparian Assessment Methods Credit Hours: 1
BIO 337 - Aquatic Ecology Credit Hours: 4
CHE 223 - General Chemistry III Credit Hours: 5 [a]
CHE 331 - Organic Chemistry I Credit Hours: 4
ENV 111 - Intro to Env Sciences Credit Hours: 4
ENV 314 - Env. Science, Law, & Policy Credit Hours: 3

ENV 434 - Advanced Data Analysis Credit Hours: 4
or
MATH 362 - Statistical Methods II Credit Hours: 4

ENV 484 - Sustainable Human Ecology Credit Hours: 4
GEOG 105 - Physical Geography Credit Hours: 4 [a]
GIS 134 - Geographic Info Systems Credit Hours: 3
Technical Emphasis Elective Credit Hours: 3 [b]

Total Needed: 51 Credit Hours

[a] CHE 223 and GEOG 105 should be taken as Civil Engineering Math/Science electives
[b] This technical emphasis elective must have a CHE prefix; different courses are offered every year

Computer Systems Engineering Technology Department

Todd Breedlove, *Department Chair*
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Assistant Professors: L. Cordova, P. Howard, M. Healy, K. Pintong, T. Scevers
Lecturers: G. Drouant, P. Govindan, P. Hannan

Degrees Offered

- Bachelor of Science in Computer Engineering Technology
- Bachelor of Science in Software Engineering Technology
- Bachelor of Science in Embedded Systems Engineering Technology
- Associate of Engineering in Computer Engineering Technology
- Associate of Engineering in Software Engineering Technology

Common First-Year Curriculum

The Bachelor of Science in Computer Engineering Technology, Bachelor of Science in Software Engineering Technology, and Bachelor of Science in Embedded Systems Engineering Technology all share a common first-year curriculum. This allows students to go through their entire first year and be exposed to all three of our programs prior to having to choose a specific major.

Curriculum

Required courses and recommended terms during which they should be taken:

Freshman Year Fall
CST 116 - C++ Programming I Credit Hours: 4
CST 162 - Digital Logic I Credit Hours: 4
MATH 111 - College Algebra Credit Hours: 4
WRI 121 - English Composition Credit Hours: 3
Total: 15 Credit Hours

Winter
CST 126 - C++ Programming II Credit Hours: 4
CST 130 - Computer Organization Credit Hours: 3
MATH 112 - Trigonometry Credit Hours: 4
SPE 111 - Public Speaking Credit Hours: 3
WRI 122 - Argumentative Writing Credit Hours: 3
Total: 17 Credit Hours

Spring
CST 120 - Embedded C Credit Hours: 4
CST 131 - Computer Architecture Credit Hours: 3
CST 136 - OOP with C++ Credit Hours: 4
MATH 251 - Differential Calculus Credit Hours: 4
Total: 15 Credit Hours

Required Student Equipment

Successful completion of this degree requires intensive, hands-on use of computers. Therefore, all students are required to own their own computer. To ensure compatibility with campus-wide computers and networks, students should consult a department faculty member for a specification sheet. Financial aid may be available to help defray the cost of this equipment. Please consult the Financial Aid Office at Oregon Tech.

Note: The Portland-Metro campus is a laptop-required campus with resources like laptop specifications, financial aid, and helpful instructions found at http://www.oit.edu/portland-metro/college-costs/bring-your-own-device.

Cooperative Field Experience

The cooperative program includes work experience during the junior and senior years. The co-op period is an employment arrangement with an employer in the area of the student's major field with normal salary and academic credit. These arrangements are made on an individual basis and the student is under no obligation to accept permanent employment with any previous co-op employer.

A student must have junior standing in their degree program to be considered for this program.

Accreditation

The Bachelor of Science in Computer Engineering Technology program is accredited by the Engineering Technology Accreditation Commission of ABET, https://www.abet.org

The Bachelor of Science in Software Engineering Technology program is accredited by the Engineering Technology Accreditation Commission of ABET, https://www.abet.org

The Bachelor of Science in Embedded Systems Engineering Technology program is accredited by the Engineering Technology Accreditation Commission of ABET, https://www.abet.org

ABET is a specialized accrediting board recognized by the Council for Higher Education and/or the Secretary of the U.S. Department of Education.

High School Preparation

Coursework in computer science, mathematics, and physical science will aid students in their progress in this program.

Computer Engineering Technology

Degrees Offered

- Bachelor of Science in Computer Engineering Technology
- Associate of Engineering in Computer Engineering Technology

Students who complete the curriculum requirements in Computer Engineering Technology will be knowledgeable in the theory and applications of both computer hardware and software.

Career Opportunities

Work in the field of computer engineering technology includes: application specific integrated circuit development, firmware development, embedded systems design, software development, testing and applications of technology.

Computer Engineering Technology graduates will be involved in development of hardware, software and embedded applications that adapt digital logic and computer systems to solve problems in a wide range of industries from industrial manufacturing to consumer electronics. In addition, they may be involved in product testing and qualification or in application engineering, customer support, sales and public relations.

The associate's degree curriculum gives the student a strong foundation in both hardware and software aspects of computing, while also furnishing a solid background in general education subjects including mathematics, physics and communication. The associate degree graduate qualifies as a technician who is productive immediately upon entering the work force. The associate's degree also provides a way for students who obtain degrees in related disciplines to add breadth to their education.

The bachelor's curriculum goes beyond the associate's degree curriculum providing the greater depth and breadth of technical capability necessary for an engineer. The graduate is qualified to assume a responsible position in business or industry. Graduates may be responsible for the development, use and the maintenance of computing systems, and for the supervision of personnel.

New careers are constantly evolving in both the hardware and software branches of this field. A diversified study allows the graduate to quickly adapt to changing market conditions.

Curriculum Mission and Objectives

The mission of the Computer Engineering Technology (CET) Degree program in the Computer Systems Engineering Technology (CSET) Department at Oregon Institute of Technology is to provide an excellent education incorporating industry-relevant, applied laboratory-based design and analysis to our students. The program is to serve a constituency consisting of its graduates, employers in the high-technology industry and the members of our IAB. Major components of the CET program's mission in the CSET department are to:

- educate computer engineering technology students to meet current and future industrial challenges;
- promote a sense of scholarship, leadership and professional service among our graduates;
- enable students to create, develop, and disseminate knowledge for the applied engineering environment;
- expose students to a cross-disciplinary educational program;
- provide high tech industry employers with graduates in the computer engineering technology profession

CET Bachelor of Science Program Educational Objectives

Graduates of the Computer Engineering Technology (CET) Bachelor Degree program may be employed in a wide range of high tech industries from industrial manufacturing to consumer electronics where they will be involved in solving problems through the development of hardware, software and embedded applications. Graduates may be involved in product design, testing and qualification, application engineering, customer support, sales, or public relations.

1. Graduates will demonstrate technical competency through success in computer engineering technology positions and/or pursuit of engineering or engineering technology graduate studies if desired.
2. Graduates will demonstrate competencies in communication and teamwork skills by assuming increasing levels of responsibility and/or leadership or managerial roles.
3. Graduates will develop professionally, pursue continued learning and practice responsibly and ethically.

CET Associate Degree Program Education Objectives

Graduates of the Computer Engineering Technology (CET) Associate Degree program may be employed as technicians or in support roles in a wide range of high tech industries from industrial manufacturing to consumer electronics. Graduates may be involved in product testing and qualification, customer support, sales, or public relations.

1. Graduates will demonstrate technical competence through success in computer engineering technology technician positions.
2. Graduates will demonstrate competencies in communication and teamwork skills through positive contributions to team based engineering projects.
3. Graduates will develop professionally, pursue continued learning and practice responsibly and ethically.

Students completing the requirements for the Associate of Engineering degree should consider themselves as entry-level trainees in the careers mentioned for Bachelor of Science graduates.

Embedded Systems Engineering Technology

Degree Offered

- Bachelor of Science in Embedded Systems Engineering Technology

Mission

The mission of the Embedded Systems Engineering Technology (ESET) bachelor's degree program within the Computer Systems Engineering Technology (CSET) Department at Oregon Institute of Technology is to prepare our students for productive careers in industry and government by providing an excellent education incorporating industry relevant, applied laboratory-based instruction in both the theory and application of embedded systems engineering technology. Our focus is educating students to meet the growing workforce demand in Oregon and elsewhere for graduates prepared in both hardware and software aspects of embedded systems. Major components of the ESET program's mission in the CSET Department are:

- to educate a new generation of ESET students to meet current and future industrial challenges and emerging embedded systems engineering technology trends
- to promote a sense of scholarship, leadership, and professional service among our graduates
- to enable our students to create, develop, apply, and disseminate knowledge within the embedded systems development environment
- to expose our students to cross-disciplinary educational programs
- to provide government and high tech industry employers with graduates in embedded systems engineering technology and related professions

Career Opportunities

The Department of Computer Systems Engineering Technology offers a Bachelor of Science degree in Embedded Systems Engineering Technology (ESET) designed to build and enhance student's knowledge and skills in this high demand field. Embedded systems play an important role in society. They are the products that contain computing capabilities which are found throughout a wide spectrum of applications. Examples of embedded systems can be found in areas ranging from the entertainment industry to office systems; health care to telecommunications. Embedded systems encompass such diverse products as interactive multimedia, printers, medical equipment, avionics equipment, kitchen appliances, mobile phones, and automotive engine management units. Engineering and technological challenges abound in the design and development of such innovative products due to the high level integration of hardware and software. As they become more complex and time to market shrinks there is increasing need for skill and creativity on the part of the Embedded System Engineering Technology graduate.

If you want to:

- develop skills in design and implementation of firmware for embedded systems
- expand knowledge and apply new ideas in practical design
- gain hands-on experience in embedded system design
- bridge the gap between software and hardware design
- enhance your career opportunities in a variety of high demand areas of industrial applications,

Then the Embedded Systems Engineering Technology program is the place for you.

Objective of the Curriculum

The goal of the Embedded Systems Engineering Technology program is to prepare students with the skills demanded by real-world industrial applications. Key to this process is the direct involvement of the embedded systems industries. Specific areas of preparation include:

- embedded systems design methods–methods and techniques specific to the creation of an embedded system that integrates both software and hardware to fulfill a set of requirements
- software engineering methods–methods specific to development of software for embedded systems, including implementation, maintenance and testing
- systems software development–device driver development, multiprocessing control systems, and the software necessary to directly access and manipulate hardware
- architectural elements of embedded systems–methods and techniques for designing and implementing hardware components for embedded systems such as application-specific integrated circuits and System-On-a-Chip (SoC) technology
- real-time high-reliability and high availability processing–methods and techniques necessary for understanding, evaluating and addressing quality attributes most often associated with embedded systems such as real-time deadlines, high availability, survivability, and safety
- data communications–methods and techniques for developing distributed systems within embedded environments that use physical or wireless networking

Software Engineering Technology

Degrees Offered

- Bachelor of Science in Software Engineering Technology
- Associate of Engineering in Software Engineering Technology

Students who complete the curriculum requirements in Software Engineering Technology will be qualified and knowledgeable in the establishment and use of sound engineering principles (methods) in order to create software of all types that is reliable and works on real machines.

Career Opportunities

Bachelor of Science in Software Engineering Technology degree graduates find employment as software engineers, systems engineers, software quality specialists, systems analysts, programmer/analysts, researchers and assistants, consultants, etc., responsible for the design, development, and implementation of software in all areas of industry, government and education.

Students completing the requirements for the Associate of Engineering degree should consider themselves as entry-level trainees in the careers mentioned for Bachelor of Science graduates.

Bachelor Program Mission

The mission of the Software Engineering Technology (SET) Bachelor's Degree Program within Computer Systems Engineering Technology (CSET) Department at Oregon Institute of Technology is to prepare our students for productive careers in industry and government by providing an excellent education incorporating industry-relevant, applied laboratory-based instruction in both the theory and application of software engineering. The program is to serve a constituency consisting of our graduates, our employers and our Industrial Advisory Board. Major components of the SET Program's mission in the CSET Department are:

- to educate a new generation of Software Engineering Technology students to meet current and future industrial challenges and emerging software trends
- to promote a sense of scholarship, leadership and professional service among our graduates
- to enable our students to create, develop, apply and disseminate knowledge within the field of software engineering technology
- to expose our students to cross-disciplinary educational programs
- to provide employers with graduates in software engineering technology and related professions

Bachelor Program Educational Objectives

The Program Educational Objectives of Oregon Tech's Software Engineering Technology program are to produce graduates that:

- use their knowledge of engineering to creatively and innovatively solve difficult computer systems problems
- regularly engage in exploring, learning and applying state-of-the-art hardware and software technologies to the solution of computer systems problems
- will be an effective team member that contributes innovative software design solutions to the resolution of real world problems
- will communicate effectively, both as an individual and within multi-disciplinary teams

Associate Program Mission

The mission of the Software Engineering Technology (SET) Associate Degree program within the Computer Systems Engineering Technology (CSET) Department at Oregon Institute of Technology is to prepare our students for entry level careers in the software industry and government by providing applied laboratory based instruction. The program is to serve a constituency consisting of our graduates, our employers and our Industrial Advisory Board. Major components of the SET program's mission in the CSET Department are:

- to provide a new generation of Software Engineering Technology students with a solid background in computer programming
- to enable our students to create, develop and apply knowledge within a technical software environment
- to provide government and high tech industry employers with entry level graduates in computer programming and related professions

Associate Program Educational Objectives

The Program Educational Objectives of Oregon Tech's Software Engineering Technology program are to produce graduates that:

- assist in solving computer systems problems using their knowledge of computer programming
- regularly engage in learning and applying state-of-the-art hardware and software technologies to the solution of computer systems problems
- will communicate effectively and successfully in the workplace

Computer Engineering Technology, BS

Curriculum

Required courses and recommended terms during which they should be taken:

Freshman Year Fall
CST 116 - C++ Programming I Credit Hours: 4
CST 162 - Digital Logic I Credit Hours: 4
MATH 111 - College Algebra Credit Hours: 4
WRI 121 - English Composition Credit Hours: 3
Total: 15 Credit Hours

Winter
CST 126 - C++ Programming II Credit Hours: 4
CST 130 - Computer Organization Credit Hours: 3
MATH 112 - Trigonometry Credit Hours: 4
SPE 111 - Public Speaking Credit Hours: 3
WRI 122 - Argumentative Writing Credit Hours: 3
Total: 17 Credit Hours

Spring
CST 120 - Embedded C Credit Hours: 4
CST 131 - Computer Architecture Credit Hours: 3
CST 136 - OOP with C++ Credit Hours: 4
MATH 251 - Differential Calculus Credit Hours: 4
Total: 15 Credit Hours

Sophomore Year Fall
CST 133 - Digital Logic II Credit Hours: 4
CST 134 - Instrumentation Credit Hours: 1
CST 250 - Computer Assembly Lang Credit Hours: 4
MATH 252 - Integral Calculus Credit Hours: 4
WRI 227 - Technical Report Writing Credit Hours: 3
Total: 16 Credit Hours

Winter
CST 204 - Intro to Microcontrollers Credit Hours: 4
CST 231 - Digital Systems Design I Credit Hours: 4
EE 221 - Circuits I Credit Hours: 4
MATH 254 - Vector Calculus I Credit Hours: 4
Total: 16 Credit Hours

Spring
CST 240 - Linux Programming Credit Hours: 4
EET 237 - AC Circuits, Filters & Signals Credit Hours: 3
EET 238 - AC Circuits, Filters Lab Credit Hours: 1
SPE 321 - Small Group/Team Comm Credit Hours: 3
Advanced Math Elective Credit Hours: 4 [b]
Total: 15 Credit Hours

Junior Year Fall
CST 337 - Embedded System Architecture Credit Hours: 5
CST 315 - Embedded Sensor Inter & I/O Credit Hours: 4
CST 371 - Embedded Systems Development I Credit Hours: 4
PHY 221 - General Physics w/Calculus Credit Hours: 4
Total: 17 Credit Hours

Winter
CST 331 - Microproc Periph Interfacing Credit Hours: 5
CST 372 - Embedded Systems Develop II Credit Hours: 3
PHY 222 - General Physics w/Calculus Credit Hours: 4
Social Science Elective Credit Hours: 3
Total: 15 Credit Hours

Spring
CST 351 - Digital Systems Design II Credit Hours: 3
CST 373 - Embedded Systems Develop III Credit Hours: 2
CST 374 - Embedded Project Proposal Credit Hours: 1
PHY 223 - General Physics w/Calculus Credit Hours: 4
WRI 327 - Advanced Tech Writing Credit Hours: 3
Humanities Elective Credit Hours: 3
Total: 16 Credit Hours

Senior Year Fall
BUS 304 - Engineering Management Credit Hours: 3
CST 418 - Data Comm & Networks Credit Hours: 3
CST 471 - Embedded Senior Project Credit Hours: 3
PHIL 331 - Ethics in the Professions Credit Hours: 3
Technical Elective Credit Hours: 3 [a]
Total: 15 Credit Hours

Winter
CST 344 - Interm Computer Arch Credit Hours: 3
CST 472 - Embedded Senior Project Credit Hours: 3
MGT 345 - Engineering Economy Credit Hours: 3
Social Science Elective Credit Hours: 3
Technical Elective Credit Hours: 3
Total: 15 Credit Hours

Spring
ANTH 452 - Globalization Credit Hours: 3
CST 473 - Embedded Senior Project Credit Hours: 2
CST 442 - Adv Comp Architecture Credit Hours: 3
Humanities Elective Credit Hours: 3
Social Science Elective Credit Hours: 3
Total: 14 Credit Hours

Total for a B.S. in Computer Engineering Technology: 186 Credit Hours

[a] See your advisor for acceptable technical electives
[b] Electives: MATH 253, MATH 465, MATH 341 or MATH 321

Computer Engineering Technology/Software Engineering Technology, BS

Concurrent Degree

The CSET Department provides the opportunity for the interested student to earn a bachelor's degree in Computer Engineering Technology and Software Engineering Technology concurrently. Such concurrent degree holders are highly sought after in industry since they know and understand both the hardware and software aspects of computers. The purpose of the concurrent CET/SET degree program is to challenge the brightest and most motivated students to become even better prepared for the job market, extending their time in college by an additional year. To obtain both degrees, students must complete the following listed courses along with the courses required for the Bachelor of Science degree in Computer Engineering Technology, with the exception of WRI 327, the CST elective and the MATH elective.

Curriculum

CST 136 - OOP with C++ Credit Hours: 4
CST 211 - Data Structures Credit Hours: 4
CST 229 - Introduction to Grammars Credit Hours: 3
CST 236 - Engineering for Quality Software Credit Hours: 4
CST 238 - GUI Programming Credit Hours: 4
CST 276 - Software Design Pattern Credit Hours: 4
CST 320 - Compiler Methods Credit Hours: 4
CST 324 - Database Systems and Design Credit Hours: 4
CST 334 - Project Proposal Credit Hours: 1
CST 352 - Operating Systems Credit Hours: 4
CST 412 - Senior Development Proj Credit Hours: 3
CST 422 - Sr Development Project Credit Hours: 3
CST 432 - Senior Development Proj Credit Hours: 2
CST 415 - Computer Networks Credit Hours: 4
CST Technical Electives Credit Hours: 9 [a]
MATH Elective Credit Hours: 3/4 [b]
MATH 465 - Mathematical Statistics Credit Hours: 4

WRI 327 - Advanced Tech Writing Credit Hours: 3
or
WRI 350 - Documentation Develop Credit Hours: 3

Notes:

[a] One Elective must be a CET hardware technical elective—a Hardware CST 407, or CST 456 **OR** one Elective must be a SET software technical elective—CST 346, CST 356, CST 405, a Software CST 407, CST 426, or CST 465

[b] MATH 321, MATH 322, MATH 327, MATH 341, MATH 342, or MATH 451

Embedded Systems Engineering Technology, BS

Degree Requirements

The Bachelor of Science in Embedded Systems Engineering Technology requires 189 credit hours as prescribed by the curriculum outline.

Note: The Portland-Metro campus is a laptop-required campus with resources like laptop specifications, financial aid, and helpful instructions found at http://www.oit.edu/portland-metro/college-costs/bring-your-own-device.

Curriculum

Required courses and recommended terms during which they should be taken:

Freshman Year Fall
CST 116 - C++ Programming I Credit Hours: 4
CST 162 - Digital Logic I Credit Hours: 4
MATH 111 - College Algebra Credit Hours: 4
WRI 121 - English Composition Credit Hours: 3
Total: 15 Credit Hours

Winter
CST 126 - C++ Programming II Credit Hours: 4
CST 130 - Computer Organization Credit Hours: 3
MATH 112 - Trigonometry Credit Hours: 4
SPE 111 - Public Speaking Credit Hours: 3
WRI 122 - Argumentative Writing Credit Hours: 3
Total: 17 Credit Hours

Spring
CST 120 - Embedded C Credit Hours: 4
CST 131 - Computer Architecture Credit Hours: 3
CST 136 - OOP with C++ Credit Hours: 4
MATH 251 - Differential Calculus Credit Hours: 4
Total: 15 Credit Hours

Sophomore Year Fall
CST 133 - Digital Logic II Credit Hours: 4
CST 134 - Instrumentation Credit Hours: 1
CST 250 - Computer Assembly Lang Credit Hours: 4
CST 276 - Software Design Pattern Credit Hours: 4
MATH 252 - Integral Calculus Credit Hours: 4
Total: 17 Credit Hours

Winter
CST 204 - Intro to Microcontrollers Credit Hours: 4
CST 231 - Digital Systems Design I Credit Hours: 4
EE 221 - Circuits I Credit Hours: 4
MATH 254 - Vector Calculus I Credit Hours: 4
Total: 16 Credit Hours

Spring
CST 211 - Data Structures Credit Hours: 4
CST 240 - Linux Programming Credit Hours: 4
PSY 201 - Psychology Credit Hours: 3
SPE 321 - Small Group/Team Comm Credit Hours: 3
Total: 14 Credit Hours

Junior Year Fall
CST 315 - Embedded Sensor Inter & I/O Credit Hours: 4
CST 337 - Embedded System Architecture Credit Hours: 5
CST 371 - Embedded Systems Development I Credit Hours: 4
PHY 221 - General Physics w/Calculus Credit Hours: 4
Total: 17 Credit Hours

Winter
CST 347 - Real Time Embedded Op Systems Credit Hours: 4
CST 372 - Embedded Systems Develop II Credit Hours: 3
PHY 222 - General Physics w/Calculus Credit Hours: 4
MATH 465 - Mathematical Statistics Credit Hours: 4
Total: 15 Credit Hours

Spring
CST 373 - Embedded Systems Develop III Credit Hours: 2
CST 374 - Embedded Project Proposal Credit Hours: 1
CST 417 - Embedded Networking Credit Hours: 4
WRI 227 - Technical Report Writing Credit Hours: 3
Laboratory Science Elective Credit Hours: 4
Humanities Elective Credit Hours: 3
Total: 17 Credit Hours

Senior Year Fall
BUS 304 - Engineering Management Credit Hours: 3
CST 455 - System on a Chip Design Credit Hours: 4
CST 471 - Embedded Senior Project Credit Hours: 3
Humanities Elective Credit Hours: 3
Social Science Elective Credit Hours: 3
Total: 16 Credit Hours

Winter
CST 456 - Embedded System Testing Credit Hours: 4
CST 472 - Embedded Senior Project Credit Hours: 3
MGT 345 - Engineering Economy Credit Hours: 3
WRI 350 - Documentation Develop Credit Hours: 3
Social Science Elective Credit Hours: 3
Total: 16 Credit Hours

Spring
ANTH 452 - Globalization Credit Hours: 3
CST 466 - Embedded System Security Credit Hours: 3
CST 473 - Embedded Senior Project Credit Hours: 3
Humanities Elective Credit Hours: 3
Technical Elective Credit Hours: 3 [a]
Total: 14 Credit Hours

Total for a B.S. in Embedded Systems Engineering Technology: 189 Credit Hours

[a] One additional CST upper division course

Software Engineering Technology, BS

Degree Requirements

The Bachelor of Science in Software Engineering Technology degree requires 187 credit hours as prescribed by the curriculum outline.

Curriculum

Required courses and recommended terms during which they should be taken:

Freshman Year Fall
CST 116 - C++ Programming I Credit Hours: 4
CST 162 - Digital Logic I Credit Hours: 4
MATH 111 - College Algebra Credit Hours: 4
WRI 121 - English Composition Credit Hours: 3
Total: 15 Credit Hours

Winter
CST 126 - C++ Programming II Credit Hours: 4
CST 130 - Computer Organization Credit Hours: 3
MATH 112 - Trigonometry Credit Hours: 4
SPE 111 - Public Speaking Credit Hours: 3
WRI 122 - Argumentative Writing Credit Hours: 3
Total: 17 Credit Hours

Spring
CST 120 - Embedded C Credit Hours: 4
CST 131 - Computer Architecture Credit Hours: 3
CST 136 - OOP with C++ Credit Hours: 4
MATH 251 - Differential Calculus Credit Hours: 4
Total: 15 Credit Hours

Sophomore Year Fall
CST 250 - Computer Assembly Lang Credit Hours: 4
CST 276 - Software Design Pattern Credit Hours: 4
MATH 252 - Integral Calculus Credit Hours: 4
WRI 227 - Technical Report Writing Credit Hours: 3
Total: 15 Credit Hours

Winter
CST 211 - Data Structures Credit Hours: 4
CST 240 - Linux Programming Credit Hours: 4
MATH 254 - Vector Calculus I Credit Hours: 4
PSY 201 - Psychology Credit Hours: 3
Total: 15 Credit Hours

Spring
CST 223 - Concepts of Programming Lang Credit Hours: 3
CST 236 - Engineering for Quality Software Credit Hours: 4
CST 238 - GUI Programming Credit Hours: 4
MATH 327 - Discrete Mathematics Credit Hours: 4
Total: 15 Credit Hours

Junior Year Fall
CST 229 - Introduction to Grammars Credit Hours: 3
CST 316 - JR Team-Based Proj Dev I Credit Hours: 4
CST 324 - Database Systems and Design Credit Hours: 4
PHY 221 - General Physics w/Calculus Credit Hours: 4
SPE 321 - Small Group/Team Comm Credit Hours: 3
Total: 18 Credit Hours

Winter
CST 320 - Compiler Methods Credit Hours: 4
CST 326 - JR Team-Based Proj Dev II Credit Hours: 4
PHY 222 - General Physics w/Calculus Credit Hours: 4
WRI 350 - Documentation Develop Credit Hours: 3
Total: 15 Credit Hours

Spring
CST 334 - Project Proposal Credit Hours: 1
CST 336 - JR Team-Based Proj Dev III Credit Hours: 4
CST 352 - Operating Systems Credit Hours: 4
PHY 223 - General Physics w/Calculus Credit Hours: 4
Social Science Elective Credit Hours: 3
Total: 16 Credit Hours

Senior Year Fall
BUS 304 - Engineering Management Credit Hours: 3
CST 412 - Senior Development Proj Credit Hours: 3
CST 415 - Computer Networks Credit Hours: 4
Humanities Elective Credit Hours: 3
Technical Elective Credit Hours: 3 [a]
Total: 16 Credit Hours

Winter
CST 422 - Sr Development Project Credit Hours: 3
MATH 465 - Mathematical Statistics Credit Hours: 4
Humanities Elective Credit Hours: 3
Social Science Elective Credit Hours: 3
Technical Elective Credit Hours: 3 [a]
Total: 16 Credit Hours

Spring
ANTH 452 - Globalization Credit Hours: 3
CST 432 - Senior Development Proj Credit Hours: 2
MGT 345 - Engineering Economy Credit Hours: 3
Humanities Elective Credit Hours: 3
Technical Elective Credit Hours: 3 [a]
Total: 14 Credit Hours

Total for a B.S. in Software Engineering Technology: 187 Credit Hours

[a] Three additional CST upper division courses. One CST upper division elective course may be exchanged for an upper division MATH course

Computer Engineering Technology, AE

Curriculum

Required courses and recommended terms during which they should be taken:

Freshman Year Fall
CST 116 - C++ Programming I Credit Hours: 4
CST 162 - Digital Logic I Credit Hours: 4
MATH 111 - College Algebra Credit Hours: 4
WRI 121 - English Composition Credit Hours: 3
Total: 15 Credit Hours

Winter
CST 126 - C++ Programming II Credit Hours: 4
CST 130 - Computer Organization Credit Hours: 3
MATH 112 - Trigonometry Credit Hours: 4
SPE 111 - Public Speaking Credit Hours: 3
WRI 122 - Argumentative Writing Credit Hours: 3
Total: 17 Credit Hours

Spring
CST 120 - Embedded C Credit Hours: 4
CST 131 - Computer Architecture Credit Hours: 3
CST 136 - OOP with C++ Credit Hours: 4
MATH 251 - Differential Calculus Credit Hours: 4
Total: 15 Credit Hours

Sophomore Year Fall
CST 133 - Digital Logic II Credit Hours: 4
CST 134 - Instrumentation Credit Hours: 1
CST 250 - Computer Assembly Lang Credit Hours: 4
MATH 252 - Integral Calculus Credit Hours: 4
WRI 227 - Technical Report Writing Credit Hours: 3
Total: 16 Credit Hours

Winter
CST 204 - Intro to Microcontrollers Credit Hours: 4
CST 231 - Digital Systems Design I Credit Hours: 4
EE 221 - Circuits I Credit Hours: 4
PHY 221 - General Physics w/Calculus Credit Hours: 4
Total: 16 Credit Hours

Spring
CST 240 - Linux Programming Credit Hours: 4
EET 237 - AC Circuits, Filters & Signals Credit Hours: 3
EET 238 - AC Circuits, Filters Lab Credit Hours: 1
PHY 222 - General Physics w/Calculus Credit Hours: 4
Humanities or Social Science Elective Credit Hours: 3
Total: 15 Credit Hours

Total Required for an Associate of Engineering in Computer Engineering Technology: 94 Credit Hours

Software Engineering Technology, AE

Degree Requirements

Associate of Engineering degree students must complete 96 credit hours as prescribed by the curriculum outline.

Curriculum

Required courses and recommended terms during which they should be taken:

Freshman Year Fall
CST 116 - C++ Programming I Credit Hours: 4
CST 162 - Digital Logic I Credit Hours: 4
MATH 111 - College Algebra Credit Hours: 4
WRI 121 - English Composition Credit Hours: 3
Total: 15 Credit Hours

Winter
CST 126 - C++ Programming II Credit Hours: 4
CST 130 - Computer Organization Credit Hours: 3
MATH 112 - Trigonometry Credit Hours: 4
SPE 111 - Public Speaking Credit Hours: 3
WRI 122 - Argumentative Writing Credit Hours: 3
Total: 17 Credit Hours

Spring
CST 120 - Embedded C Credit Hours: 4
CST 131 - Computer Architecture Credit Hours: 3
CST 136 - OOP with C++ Credit Hours: 4
MATH 251 - Differential Calculus Credit Hours: 4
Total: 15 Credit Hours

Sophomore Year Fall
CST 276 - Software Design Pattern Credit Hours: 4
MATH 252 - Integral Calculus Credit Hours: 4
PSY 201 - Psychology Credit Hours: 3
WRI 227 - Technical Report Writing Credit Hours: 3
Technical Elective Credit Hours: 3 [a]
Total: 17 Credit Hours

Winter
CST 211 - Data Structures Credit Hours: 4
CST 240 - Linux Programming Credit Hours: 4
PHY 221 - General Physics w/Calculus Credit Hours: 4
Humanities Elective Credit Hours: 3
Total: 15 Credit Hours

Spring
CST 223 - Concepts of Programming Lang Credit Hours: 3
CST 236 - Engineering for Quality Software Credit Hours: 4
CST 238 - GUI Programming Credit Hours: 4
Social Science Elective Credit Hours: 3
Elective Credit Hours: 3
Total: 17 Credit Hours

Total for an Associate of Engineering in Software Engineering Technology: 96 Credit Hours

[a] See your advisor for acceptable elective classes

Electrical Engineering and Renewable Energy Department

Hope Corsair, *Department Chair*
Eve Klopf, *Program Director, B.S. Electrical Engineering (Klamath Falls)*
Mason Terry, *Program Director, B.S. Renewable Energy Engineering (Klamath Falls)*
Aaron Scher, *Program Director, B.S. Electrical Engineering and B.S. Electronics Engineering Technology (Portland-Metro)*
Scott Prahl, *Program Director, Optical Engineering (Portland-Metro)*
Claudia Torres Garibay, *Program Director, B.S. Renewable Energy Engineering (Portland-Metro)*
Mateo Aboy, *Program Director, M.S. Engineering (Portland-Metro, Online)*
Teshome Jiru, *Program Director, M.S. Renewable Energy Engineering (Portland-Metro)*
Robert F. Melendy, *Program Director, Robotics, Autonomous Systems, and Control Engineering (Portland-Metro)*
Professors: M. Aboy, C. Crespo, S. Prahl, S. Petrovic
Associate Professors: H.J. Corsair, A. Douglas, T. Jiru, E. Klopf, R.F. Melendy, A. Scher M. Terry, C. Torres Garibay
Assistant Professors: O. Dobzhanskyi, J. Eastham, E. Hossain, F. Shi, C. Venugopal
Additional Faculty: A. Metwally

Degrees Offered

- Master of Science in Engineering - Multiple Specialties (Portland-Metro and Online)
- Master of Science in Renewable Energy Engineering (Klamath Falls and Portland-Metro)
- Bachelor of Science in Electrical Engineering (Klamath Falls and Portland-Metro)
- Bachelor of Science in Electronics Engineering Technology (Portland-Metro)
- Bachelor of Science in Renewable Energy Engineering (Klamath Falls and Portland-Metro)

Dual Majors Offered

- Robotics, Autonomous Systems, and Control Engineering (Portland-Metro)
- Optical Engineering (Portland-Metro)
- Systems Engineering and Technical Management (Online)

Electrical Engineering

Degrees Offered

- Master of Science in Engineering and Bachelor of Science in Electrical Engineering - Robotics, Autonomous Systems, and Control Engineering
- Master of Science in Engineering and Bachelor of Science in Electrical Engineering - Electrical Engineering
- Master of Science in Engineering and Bachelor of Science in Electrical Engineering - Embedded Engineering
- Master of Science in Engineering and Bachelor of Science in Electrical Engineering- Optical Engineering
- Master of Science in Engineering and Bachelor of Science in Electrical Engineering - Multiple Disciplines (4+1 or concurrent degree)
- Master of Science in Renewable Energy Engineering and Bachelor of Science in Electrical Engineering (concurrent degree)
- Bachelor of Science in Electrical Engineering
- Bachelor of Science in Electrical Engineering and Robotics, Autonomous Systems, and Control Engineering (dual major)
- Bachelor of Science in Electrical Engineering and Optical Engineering (dual major)
- Bachelor of Science in Electrical Engineering and Systems Engineering & Technical Management (dual major)
- Bachelor of Science in Electrical Engineering and Bachelor of Science in Renewable Energy Engineering (concurrent degree)

Note: The BS Electrical Engineering is offered at both the Klamath Falls and Portland-Metro campuses. The different degree options (technical emphases, dual majors, etc.) may vary by campus.

Career Opportunities

The Bachelor of Science in Electrical Engineering (BSEE) at Oregon Tech is designed to prepare professionals to meet the needs of the growing Electrical Engineering industry. Electrical engineering is concerned with the use of electricity to transmit electric power, or to process information. Electrical engineers design, develop, test, and integrate electrical power systems and electrical machines, as well as electronic systems, including portable electronic devices, medical equipment, communication systems, radar and navigation systems, control and autonomous systems, to include robotics.

The program is designed around a set of core courses which provide a classical electrical engineering foundation, and a number of elective courses that allow students some flexibility to specialize in areas of particular interest, such as electronics, electrical power, optical engineering, renewable energy, etc. Emphasis is placed on practical application of engineering knowledge. The BSEE program at Oregon Tech can accommodate full-time students, transfer students, and working professionals, and provides a solid preparation for industry or graduate school.

Graduates of the Electrical Engineering Program are prepared to fulfill a wide range of functions within industry. Employers of electrical engineering graduates include research and development laboratories, electronic equipment manufacturers, public utilities, colleges and universities, government agencies, medical laboratories and hospitals, electronic equipment distributors, and semiconductor companies, among others.

The program also provides a solid preparation for students intending to continue to graduate school to pursue master's degrees in engineering, engineering management, MBAs, and JDs.

Program Mission and Objectives

The mission of the BS Electrical Engineering program is to provide a comprehensive program of instruction that will enable graduates to obtain the knowledge and skills necessary for immediate employment and continued advancement in the field of electrical engineering.

Graduates of the BSEE program will:

1. Possess a strong technical background as well as analytical, critical-thinking, and problem-solving skills that enable them to excel as professionals contributing to a variety of engineering roles within the various fields of Electrical Engineering and the high-tech industry;
2. Be employed in Electrical Engineering positions including (but not limited to) design engineers, test engineers, characterization engineers, applications engineers, field engineers, hardware engineers, process engineers, control engineers, and power engineers;
3. Be committed to professional development and lifelong learning by engaging in professional or graduate education in order to stay current in their field and achieve continued professional growth;
4. Be working as effective team members possessing excellent oral and written communication skills, and assuming technical and managerial leadership roles throughout their career.

Student Preparation

Students entering the Electrical Engineering program from high school should have a minimum of: 1) Two years of high-school algebra and one year of high-school geometry and trigonometry. 2) Two years of a physical science (physics, chemistry preferred). 3) Three years of English composition. Additional mathematics, science, English, electronics, and computer languages are very helpful.

Students entering the Electrical Engineering program by transfer are requested to contact the department concerning transfer of technical coursework.

Note: The Portland-Metro campus is a laptop-required campus with resources like laptop specifications, financial aid, and helpful instructions found at http://www.oit.edu/portland-metro/college-costs/bring-your-own-device.

Accreditation

The BSEE program is accredited by the Engineering Accreditation Commission (EAC) of ABET, Inc., http://www.abet.org. ABET is a specialized accrediting board recognized by the Council for Higher Education and/or the Secretary of the U.S. Department of Education.

Bachelor of Science in Electrical Engineering (Post-Baccalaureate)

Oregon Tech Bachelor of Science in Electronics Engineering Technology graduates may complete 36 additional credits to receive a Bachelor of Science in Electrical Engineering (post-baccalaureate). Students will receive two diplomas: a BSEET degree (upon completion of the BSEET degree requirements), and a BSEE degree (upon completion of the BSEE degree requirements, which include a minimum of 36 credits from Oregon Tech beyond the BSEET requirements).

Students who have completed an ABET accredited BS degree in Electronics Engineering Technology from another university must complete a minimum of 45 Oregon Tech credits to receive the BS in Electrical Engineering from Oregon Tech. Students pursuing this option should contact an academic advisor to draft an academic plan that ensures all BSEE curriculum requirements are met.

Bachelor of Science in Electrical Engineering with a Dual Major

Students completing the BSEE program have the option of selecting a dual major. The EERE department currently offers a dual major in Robotics, Autonomous Systems, and Control Engineering, a dual major in Optical Engineering, and a dual major in Systems Engineering & Technical Management. Students completing a BSEE degree with a dual major will receive a single BS degree with both majors listed on their diploma and transcript. The degree is issued upon completion of the requirements for each major (some courses may be used to meet the requirements for both majors). The requirements for the dual major in Optical Engineering, as well as the dual major in Systems Engineering & Technical Management are listed under the corresponding sections of the catalog.

Concurrent Degree in Electrical Engineering and Renewable Energy Engineering

The EERE Department provides the opportunity for interested and motivated students to earn two Bachelor of Science degrees concurrently: a BS in Electrical Engineering & BS in Renewable Energy Engineering. The purpose of this concurrent degree is to provide the top students with a challenging academic program that will prepare them for career opportunities in the electronics, electrical engineering, power, and energy industries. The students receive a BS degree in a classical engineering discipline (Electrical Engineering), as well as an emerging high growth discipline (Renewable Energy Engineering). This concurrent degree program takes approximately an additional year beyond the BSEE degree program (or 4.5 years total by taking courses in Summer term).

Concurrent Accelerated MSREE/BSEE

Students may earn both MSREE and BSEE degrees, awarded simultaneously upon completion of this curriculum. Students enrolled in the BSEE program who have a proven record of academic excellence have the option of completing the MSREE with one additional year of coursework.

To be eligible for this option, students must have a cumulative GPA of 3.0, and must contact the MSREE Program Director for admission into the graduate program by the end of Spring term of their junior year. Students will receive both their BSEE and MSREE degrees at the end of their fifth year. REE 599 requirement must be met by a design project supervised and approved by both EE and REE advisors. Students should contact their academic advisors for details.

Concurrent Accelerated MSE/BSEE

Students may earn both MSE and BSEE degrees, awarded simultaneously upon completion of this curriculum. Students enrolled in the BSEE program who have a proven record of academic excellence have the option of completing the MSE with one additional year of coursework.

To be eligible for this option, students must have a cumulative GPA of 3.0, and must apply for admission into the graduate program by the end of Spring term of their junior year. Students will receive both their BSEE and MSE degrees at the end of their fifth year. Students pursuing this option gain some efficiency by using graduate-level coursework and a graduate project to also satisfy undergraduate coursework and senior capstone project requirements. Students can contact the MSE program director for details.

Electronics Engineering Technology

Degree Offered

- Bachelor of Science in Electronics Engineering Technology (Portland-Metro)

Oregon Institute of Technology offers an ABET accredited Bachelor of Science degree in Electronics Engineering Technology (BSEET). The program is conveniently offered at the Oregon Tech Portland-Metro campus, as well as the Willow Creek Center, in order to accommodate degree seeking professionals working for high-tech companies in the Portland Westside area. The Willow Creek Center is located in Hillsboro (OR), at the heart of the Portland Westside high-tech industry cluster (Silicon Forest), minutes away from companies such as Intel, Tektronix, MAXIM, Credence, Synopsis, Quorvo, and others. Some of the core and technical elective courses for the degree are also available online and at the Oregon Tech Portland-Metro campus.

Career Opportunities

Electronics Engineering Technology is concerned with theory, concepts, and practice of applied electronics engineering. Emphasis is placed on the practical application of engineering knowledge. As a result, the Electronics Engineering Technology graduate possesses a combination of theoretical and practical understanding and requires minimal on-the-job training.

The BSEET program is designed to prepare graduates to assume engineering and technology positions in the electronics industry. Graduates of the BSEET program fulfill a wide range of functions within industry, typically assuming positions such as component and system design, test engineering, product engineering, field engineering, manufacturing engineering, sales or market engineering, quality control engineering, and other similar roles. The program also provides a solid preparation for students intending to continue to graduate school to pursue master's degrees in engineering, engineering management, and MBAs.

Employers of Electronics Engineering Technology graduates include research and development laboratories, electronic equipment manufacturers, public utilities, colleges and universities, government agencies, medical laboratories and hospitals, electronic equipment distributors, semiconductor companies, and automated electronic controlled processing companies. Recent graduates have been employed at companies such as MAXIM, Tektronix, Quorvo, MSEI/Biotronik, and Intel.

Program Mission and Objectives

The mission of the BSEET Program is to provide a comprehensive program of instruction that will enable graduates to obtain the knowledge and skills necessary for immediate employment and continued advancement in the field of electronics.

Graduates of the BSEET program will:

1. Possess a strong technical background as well as analytical and problem solving skills, and will contribute in a variety of technical roles within the electronics and high-tech industry. Within three years of graduation, BSEET graduates are expected to be employed as test engineers, characterization engineers, applications engineers, field engineers, hardware engineers, process engineers, and similar engineering technology positions within this industry.
2. Be working as effective team members with excellent oral and written communication skills, assuming technical and managerial leadership roles throughout their career.
3. Be committed to professional development and lifelong learning by engaging in professional and/or graduate education in order to stay current in their field and achieve continued professional growth.

Student Preparation

The BSEET degree at Oregon Tech is designed to accommodate working professionals with evening delivery of upper-division and custom bridging courses. It is especially suited for working professionals with an associate degree in Electronics Engineering Technology, Microelectronics Technology, or equivalent coursework. Students entering the BSEET program by transfer are requested to contact the BSEET Program Director concerning transfer of technical coursework. The BSEET program has articulation and transfer agreements with the Electronics, Microelectronics, and Renewable Energy Technology programs at various community colleges in Oregon. Students transferring to Oregon Tech with an AAS degree from these programs will not be required to take any lower-division electronics coursework. It is recommended (but not required) that students who are transferring with an AAS degree have completed Calculus II prior to transferring to the BSEET program at Oregon Tech, since Integral Calculus is a prerequisite for most upper-division BSEET courses.

We encourage transfer students to start the advising process with Oregon Tech upon completion of the first year of their AAS degree.

Note: The Portland-Metro campus is a laptop-required campus with resources like laptop specifications, financial aid, and helpful instructions found at http://www.oit.edu/portland-metro/college-costs/bring-your-own-device.

Accreditation

The Electronics Engineering Technology program is accredited by the Engineering Technology Accreditation Commission (ETAC) of ABET, Inc., http://www.abet.org. ABET is a specialized accrediting board recognized by the Council for Higher Education and/or the Secretary of the U.S. Department of Education.

Renewable Energy Engineering

Degrees Offered

- Master of Science in Renewable Energy Engineering
- Bachelor of Science in Renewable Energy Engineering
- Bachelor of Science in Renewable Energy Engineering and Robotics, Autonomous Systems, and Control Engineering (dual major)
- Bachelor of Science in Renewable Energy Engineering and Optical Engineering (dual major)
- Bachelor of Science in Renewable Energy Engineering and Systems Engineering & Technical Management (dual major)

- Bachelor of Science in Renewable Energy Engineering and Bachelor of Science in Electrical Engineering (concurrent degree)
- Bachelor of Science in Renewable Energy Engineering and Bachelor of Science in Environmental Science (concurrent degree)
- Bachelor of Science in Renewable Energy Engineering and Master of Science in Engineering (concurrent degree)
- Bachelor of Science in Renewable Energy Engineering and Master of Science in Renewable Energy Engineering (concurrent degree)

Note: The BS Renewable Energy Engineering is offered in both the Klamath Falls and Portland-Metro campuses. The different degree options (dual majors, concurrent degrees, etc.) may vary by campus. The MS Renewable Energy Engineering is offered at both the Klamath Falls and Portland-Metro campuses.

Career Opportunities

Program graduates will enter energy careers as power engineers, PV/semiconductor processing engineers, facilities and energy managers, energy system integration engineers, HVAC and M/E/P engineers, design and modeling engineers for net-zero energy buildings, biofuels plant and operations engineers, energy systems control engineers, power electronics engineers, utility program managers, as well as renewable energy planners and policy makers. Graduates of the program will be able to pursue a wide range of career opportunities, not only within the emerging field of renewable energy, but within more traditional areas of energy engineering as well.

Employers of Renewable Energy Engineering graduates include consulting engineering firms, fuel cell manufacturers, power converter manufacturers, public utilities, government agencies, photovoltaic manufacturers, and energy developers. Recent graduates have been employed at companies such as Advanced Energy, Jacobs Engineering, Power Engineers, and Iberdrola Renewables.

Bachelor of Science in Renewable Energy Engineering

The Bachelor of Science in Renewable Energy Engineering (BSREE) prepares students for the challenges of designing, promoting and implementing renewable energy engineering in societies rapidly-changing energy-related industries. Energy, in its many abundant forms, is the driving physical factor upon which industrial societies are founded. As geopolitical, environmental and geological factors act to constrain traditional resources, societies have been forced to re-think and redevelop their energy infrastructures. Renewable energy resources include solar thermal collectors, photovoltaics, and ground-source heat pumps, geothermal resources, hydroelectric power, wind power, tidal and wave power, bioenergy, and fuel cells. Oregon Tech's Bachelor of Science in Renewable Energy Engineering prepares students for success in these rapidly developing fields.

The BSREE program is built upon a solid foundation in physics, chemistry, mathematics and communications. Added to this foundation are courses in electrical and mechanical engineering that establish a firm understanding of the fundamentals of energy. The engineering coursework prepares students for renewable energy-specific courses such as photovoltaics, wind power, biofuels, hydroelectric, fuel cells and solar thermal systems. These courses are then integrated into system-wide senior level courses such as energy system design, energy-efficient building systems, renewable energy transportation systems, energy management and energy systems control.

Program Mission and Objectives

The mission of the Bachelor of Science in Renewable Energy Engineering program is to prepare students for the challenges of designing, promoting and implementing renewable energy solutions in societies rapidly changing energy-related industry cluster, particularly within Oregon and the Pacific Northwest. Graduates will have a fundamental understanding of energy engineering and a sense of social responsibility for the implementation of sustainable energy solutions.

Graduates from the BSREE program will:

1. Excel as professionals in the various fields of energy engineering.
2. Be known for their commitment to lifelong learning, social responsibility, and professional and ethical responsibilities in implementing sustainable engineering solutions.
3. Excel in critical thinking, problem solving and effective communication.

Student Preparation

High school students should be prepared to start their college academic work with at least college calculus and Freshman English composition. Typically, this means the successful new student has completed:

1. Four years of high school mathematics including algebra I and II, geometry and trigonometry
2. Four years of English composition/writing
3. Four years of science including physics and chemistry

Students entering the program by transfer are requested to contact the program director for evaluation of REE-related transfer courses.

Note: The Portland-Metro campus is a laptop-required campus with resources like laptop specifications, financial aid, and helpful instructions found at http://www.oit.edu/portland-metro/college-costs/bring-your-own-device.

Accreditation

The Renewable Energy Engineering baccalaureate program is accredited by the Engineering Accreditation Commission (EAC) of ABET, Inc., http://www.abet.org. ABET is a specialized accrediting board recognized by the Council for Higher Education and/or the Secretary of the U.S. Department of Education.

Bachelor of Science in Renewable Energy Engineering with a Dual Major

Students completing the BSREE program have the option of selecting a dual major. The EERE department currently offers a dual major in Robotics, Autonomous Systems, and Control Engineering, a dual major in Optical Engineering, and a dual major in Systems Engineering & Technical Management. Students completing a BSREE degree with a dual major will receive a single BS degree with both majors listed on their diploma and transcript. The degree is issued upon completion of the requirements for each major (some courses may be used to meet the requirements for both majors). The requirements for the dual major in Optical Engineering, as well as the dual major in Systems Engineering & Technical Management are listed under the corresponding sections of the catalog.

Concurrent Degree in Renewable Energy Engineering and Electrical Engineering

The EERE Department provides the opportunity for interested and motivated students to earn two Bachelor of Science degrees: a BS in Renewable Energy Engineering and a BS in Electrical Engineering. The purpose of this concurrent degree is to provide the top students with a challenging academic program that will prepare them for career opportunities in the electronics, electrical engineering, power and energy industries. The students receive a BS degree in a classical engineering discipline (Electrical Engineering), as well as an emerging high-growth discipline (Renewable Energy Engineering). The degree program will take an additional year beyond the BSREE degree program (or 4.5 years total by taking courses in Summer term.)

Concurrent Degree in Renewable Energy Engineering and Environmental Sciences

Renewable Energy Engineering students have the opportunity to earn a concurrent degree: a BS in Renewable Energy Engineering and a BS in Environmental Sciences. The additional degree requires 54 credits in Environmental Sciences courses, which can be taken concurrent to Renewable Energy Engineering courses or in an add-on year. A second degree in Environmental Sciences places engineering projects in the context of environmental impacts and environmental regulations, and greatly increases job opportunities for Oregon Tech Renewable Energy Engineering graduates. The purpose of the concurrent programs is to challenge motivated students to become even better prepared for the engineering and environmental job markets.

Concurrent Accelerated MSE/BSREE Program

Students enrolled in the BSREE program with a record of academic excellence have the option of earning both a BSREE and a MS Engineering (MSE) degree with an additional year of study. The MSE is a flexible multidisciplinary master's degree which is highly customizable to adapt to students' interests and industry needs. Students can select between different tracks or specialties, with the possibility of obtaining a more classical or more specialized graduate degree based on the track selected.

The accelerated and 4+1 options provide efficiency by allowing students to start their graduate level coursework in their senior year, and use some of these courses to simultaneously meet degree requirements for both the BS and MS programs. In the accelerated/concurrent program, students are awarded the BS and MSE degree concurrently at the end of their fifth year of study. On the other hand, in the 4+1 program, the BS degree is awarded in the fourth year, and the MSE degree is awarded in the fifth year. The accelerated option offers the most efficiency in terms of overall credit requirements. To be eligible for the accelerated and 4+1 options, students must have a cumulative GPA of 3.0, and apply for admission into the graduate program by the end of Spring term of their junior year.

Students pursuing the accelerated or 4+1 options follow the standard BSREE curriculum for the first three years, start their graduate coursework in their senior year, and complete the MSE requirements during their fifth (graduate) year.

Concurrent Accelerated MSREE/BSREE Program

Students may earn both MSREE and BSREE degrees, awarded simultaneously upon completion of this curriculum. Students who enrolled in the BSREE program who have a proven record of academic excellence have the option of completing the MSREE with one additional year of coursework.

To be eligible for this option, students must have a cumulative GPA of 3.0, and must contact the MSREE Program Director for admission into the graduate program by the end of Spring term of their junior year. Students will receive both their BSREE and MSREE degrees at the end of their fifth year. REE 599 requirement must be met by a design project supervised and approved by an REE advisor. Students should contact their academic advisors for details.

Master of Science in Engineering - Multiple Disciplines

The Master of Science in Engineering (MSE) is a highly customizable and modular MS program, which enables students to choose coursework from multiple disciplines to design specialties typically not available in the classical engineering disciplines. MSE students have the ability to customize the MSE to be highly relevant to their professional interests. The flexibility to design a specialized or multidisciplinary degree program, while maintaining practical focus and academic rigor, is the defining element of the program and is what makes it such a close match to the interdisciplinary environment in today’s fast changing industries. This ensures a relevant, up-to-date educational experience, and the ability to meet urgent industry needs in multidisciplinary technical fields. Depending on their interest and career goals students can choose a multidisciplinary MSE, a specialized MSE, or a more classical MSE program such as the MSE in Electrical Engineering. The MSE program can accommodate full-time students or working professionals.

Program Mission and Objectives

The MSE at Oregon Tech is designed to prepare engineering professionals with advanced knowledge and skills in high-demand multi-disciplinary engineering fields who are ready to assume a broad range of technical and leadership roles.

Note: The Portland-Metro campus is a laptop-required campus with resources like laptop specifications, financial aid, and helpful instructions found at http://www.oit.edu/portland-metro/college-costs/bring-your-own-device.

MSE/BS Concurrent Fast Track Degree (5 year Program)

Students enrolled in the EERE BS programs (BSEE, BSEET, BSREE) are eligible to apply for the concurrent Fast Track BS/MSE program. This enables students to potentially obtain both the BS and MS degrees in 5 years.

MSE Coursework & Specialties

Students can complete a multidisciplinary program by taking courses in Systems Engineering, Research Methods & Innovation (covering peer-reviewed research, IP fundamentals, and technology commercialization), and one or more engineering disciplines including Electrical & Computer Engineering.

Multidisciplinary MSE Program

- MSE (Multidisciplinary)
- MSE in Systems Engineering

Engineering Discipline MSE Program

- MSE in Electrical Engineering

Specialized MSE Programs

- MSE in Robotics, Autonomous Systems, and Control Engineering
- MSE in Embedded Systems
- MSE in Optical Engineering
- MSE in Power Engineering

Accreditation

Oregon Institute of Technology is accredited by the Northwest Commission on Colleges and Universities, 8060 165th Ave. NE, Suite 100, Redmond, WA 98052-3981, an institutional accrediting body recognized by the Council for Higher Education Accreditation and/or the Secretary of the U.S. Department of Education.

Master of Science in Renewable Energy Engineering (MSREE)

The Master of Science in Renewable Energy Engineering (MSREE) program is offered at both the Klamath Falls and Portland-Metro campuses. The MSREE program accommodates both full-time students and working professionals. The program is designed to prepare graduates to be energy engineering professionals who have advanced knowledge and skills that enable them to assume a broad range of technical leadership roles.

The MSREE curriculum is built upon core tracks in research methods & innovation and advanced energy engineering. These courses provide the foundation for three required specialized course sequences in renewable energy technologies and nine credits of thesis or graduate R&D project work.

In the second year of the program, students demonstrate mastery on a renewable energy-related topic through REE 599 – Graduate Thesis or Project Thesis. Thesis answer a question using scientific methods. Projects solve a problem using the engineering design process. In both cases, there should be an element of novelty in students work. Students who have previously received a BS in Engineering from an ABET accredited program may opt for either a Thesis or Project path, or a coursework only path in which REE 599 is substituted by technical courses.

Student Preparation

Students should be prepared to start graduate academic work. Typically, this means the successful new student has the following:

1. A baccalaureate degree in engineering, the physical sciences (e.g., physics, chemistry), or a related technical discipline
2. Evidence of potential for graduate academic work, success or potential for success in industry, and demonstrated interest in energy engineering

Accreditation

Oregon Institute of Technology is accredited by the Northwest Commission on Colleges and Universities, 8060 165th Ave. NE, Suite 100, Redmond, WA 98052-3981, an institutional accrediting body recognized by the Council for Higher Education Accreditation and/or the Secretary of the U.S. Department of Education.

Optical Engineering, BS Dual Major

Degree Offered

- Optical Engineering (Dual major)

The major in Optical Engineering is designed as a dual major degree option for students with an ABET-accredited primary major in an engineering discipline offered at Oregon Tech (e.g., Electrical Engineering, Mechanical Engineering). Students choose a primary ABET accredited engineering major and complete the additional specialized coursework to earn a second major in Optical Engineering. The Optical Engineering dual major is offered at the Portland-Metro campus.

Program Objectives

Graduates of the Optical Engineering program will:

1. Have a strong technical background in addition to the analytical, critical-thinking, and problem-solving skills needed as engineering and science professionals.
2. Be employed as optical engineers, optomechanical engineers, optoelectronics engineers, laser engineers, and similar positions in the engineering industry.
3. Understand the value of and show a commitment to professional development and lifelong learning.
4. Be effective team members with excellent oral and written communication skills, which lead to technical and managerial leadership roles.

Career Opportunities

Optical Engineering is the branch of engineering that incorporates the production, modification, and detection of light into devices and processes. Graduates of the Optical Engineering program are employed as optical engineers, illumination engineers, metrology engineers, optomechanical engineers, optoelectronics engineers, laser engineers, and similar positions in the engineering industry. A dual major in Optical Engineering provides students with the opportunity to combine engineering disciplines. This provides a competitive advantage for graduates entering the workforce because optical subsystems are now common in many engineering applications. For example, a student seeking to become an optomechanical engineer might combine with mechanical engineering; an optoelectronics engineer would combine with electrical engineering; a solar energy engineer with renewable energy engineering.

Employers of Optical Engineering graduates include more than eighty Oregon companies that encompass a diverse range of applications. These include semiconductor inspection, infrared imaging, automation, surface coatings, laser manufacture, lighting, camera design, optical fiber communication, and colorimetry.

Student Preparation
Students considering the Optical Engineering major must first select a primary engineering major and complete the freshman engineering coursework including calculus and calculus-based physics. Upon completion of the freshman primary major requirements, students interested in the Optical Engineering dual major should contact the Optical Engineering program director for an advising appointment. Students entering the Optical Engineering program by transfer are requested to contact their primary major department concerning transfer of technical coursework. Completing a year of calculus-based physics is mandatory before any optical engineering classes can be taken.

Accreditation
Completion of a dual major in Optical Engineering is contingent upon finishing primary major in an ABET accredited program.

Robotics, Autonomous Systems, and Control Engineering, BS Dual Major
Degree Offered
- Robotics, Autonomous Systems, and Control Engineering (Dual major)

The major in Robotics, Autonomous Systems, and Control Engineering is designed as a dual major option for students with an ABET accredited primary major in an engineering discipline offered at Oregon Tech. Students first choose a primary ABET accredited major (e.g., Electrical Engineering, Renewable Energy Engineering, Mechanical Engineering), and complete additional specialized coursework to earn a second major in Robotics, Autonomous Systems, and Control Engineering. The program is designed so that both majors in the degree can be completed in 4 years by taking summer courses. ABET ETAC degree students may also pursue the dual major with departmental approval.

Career Opportunities
Robotics, Autonomous Systems, and Control Engineering is a rich multidisciplinary engineering field concerned with the modeling, simulation, design, and control of automated machines, systems, and processes. Automated systems typically contain an assemblage of components, equipment, hardware, software, and humans. The discipline requires knowledge and an understanding of elements of electrical engineering, mechanical engineering, process engineering, coding, software programming, physics, and mathematics. Due to the multidisciplinary nature of the topics that make up the curriculum, graduates of the program are furnished with the necessary skills to design or manage systems that integrate diverse components and technologies. Engineers working in this field design solutions to address problems in areas such as factory automation, building automation, process control, motion control and robotics and mechanics, flight control systems, or autonomous vehicles.

Student Preparation
Students interested in the Robotics, Autonomous Systems, and Control Engineering dual major should contact the Robotics, Autonomous Systems, and Control Engineering program director for an advising appointment early in their primary major programs to ensure timely completion of both majors.

Accreditation
Completion of a dual major in Robotics, Autonomous Systems, and Control Engineering is contingent upon finishing a primary major in an ABET accredited program.

Systems Engineering & Technical Management, BS Dual Major
Degree Offered
- Systems Engineering & Technical Management (Dual major)

The major in Systems Engineering & Technical Management is designed as a dual major option for students with an ABET accredited primary major in an engineering discipline offered at Oregon Tech. Students first choose a primary ABET accredited major (e.g., Electrical Engineering, Renewable Energy Engineering, Mechanical Engineering, Civil Engineering), and complete additional specialized coursework to earn a second major in Systems Engineering & Technology Management. The program is designed so that both majors in the degree can be completed in 4 years by taking summer courses. ABET ETAC degree students may also pursue the dual major with departmental approval.

Career Opportunities
Systems engineers address complex problems in areas such as electrical & electronic systems, information systems, renewable energy systems, economic and financial systems, telecommunications, transportation, project management, and manufacturing. Systems engineering is not about specific technologies, but how to put heterogeneous technologies together to formulate system solutions to complex problems. As such, systems engineering is a multidisciplinary engineering discipline concerned with the design, modeling, analysis, and management of technological systems that employ a combination of devices, software, hardware, firmware, materials, and humans for such diverse purposes as communications, energy engineering, health care, transportation or manufacturing. The dual major curriculum provides engineering students with design viewpoints and methodologies that emphasize system integration, and with subject matter and tools for modeling and analysis especially appropriate for large complex systems including system theory, simulation, computational data analysis and statistics, and engineering management. This dual major is designed to address the need for both systems engineering and T-shape individuals at the BS level. After 4 years, graduates of the dual degree program are technically competent in an engineering discipline and ready to enter the workforce as functional engineers but also have formal education, training and skills in systems engineering, project management, product development, strategy and innovation, and engineering management to assume functional managerial positions, such as project managers and technical team leaders.

Student Preparation
Students considering the dual major in Systems Engineering & Technical Management must first select a primary engineering major and complete the freshman engineering coursework including calculus and calculus based physics. Upon completion of the freshman primary major requirements, students interested in the Systems Engineering & Technical Management dual major should contact the department chair for an advising appointment. Students who are planning to complete this dual major are encouraged to contact the department chair upon completion of the freshman year.

Accreditation

Completion of a dual major in Systems Engineering & Technical Management is contingent upon finishing a primary major in an ABET accredited program.

Concurrent Accelerated BSEE/MSE

Students enrolled in the BSEE program with a record of academic excellence have the option of earning both a BSEE and a MS Engineering (MSE) degree with an additional year of study (e.g., MSE in Electrical Engineering). The MSE is a flexible multidisciplinary master's degree which is highly customizable to adapt to students' interests and industry needs. Students can select between different tracks or specialties, with the possibility of obtaining a more classical or more specialized graduate degree based on the track selected.

The accelerated and 4+1 options provide efficiency by allowing students to start their graduate level coursework in their senior year, and use some of these courses to simultaneously meet degree requirements for both the BS and MS programs. In the accelerated/concurrent program, students are awarded the BS and MSE degree concurrently at the end of their fifth year of study. On the other hand, in the 4+1 program, the BS degree is awarded in the fourth year, and the MSE degree is awarded in the fifth year. The accelerated option offers the most efficiency in terms of overall credit requirements. To be eligible for the accelerated and 4+1 options, students must have a cumulative GPA of 3.0, and apply for admission into the graduate program by the end of Spring term of their junior year.

Students pursuing the accelerated or 4+1 options follow the standard BSEE curriculum for the first three years, start their graduate coursework in their senior year, and complete the MSE requirements during their fifth (graduate) year, according to the following guidelines:

To meet BSEE requirements:
Replace 9 credits of undergraduate required or engineering elective courses with graduate-level courses (see MSE curriculum to select adequate courses based on desired MSE track)
Replace 3 terms of ENGR 465 with 3 terms of ENGR 597

To meet additional MSREE requirements:
Research Methods and Innovation sequence (ENGR 511, ENGR 512, ENGR 513)
Additional MSE required or elective courses (see MSE curriculum to select adequate courses based on desired MSE track)

Concurrent Accelerated BSEE/MSREE

Students may earn both BSEE and MSREE degrees, awarded simultaneously upon completion of this curriculum. Students enrolled in the BSEE program who have a proven record of academic excellence have the option of completing the MSREE with one additional year of coursework.

To be eligible for this option, students must have a cumulative GPA of 3.0, and must contact the MSREE Program Director for admission into the graduate program by the end of Spring term of the junior year. Students will receive both their BSEE and MSREE degrees at the end of their fifth year. REE 599 requirement must be met by a design project supervised and approved by both EE and REE advisors. Students should contact their academic advisors for details.

Concurrent Accelerated BSEE/MSREE Program

Students pursuing this option follow the standard BSEE curriculum map during the first three years, start their graduate-level courses in the senior undergraduate year, and complete the MSREE requirements during their fifth (graduate) year, according to the following guidelines:

To meet BSEE requirements:
Replace 9 credits of engineering Electives with one graduate-level REE sequence in Electric Power (REE 529, REE 549, REE 569), PV Systems and Processing (REE 525, REE 545, REE 565), or another advisor-approved MSREE sequence.
Replace 3 terms of ENGR 465 with 3 terms of Graduate Project (REE 599, 599, 599)

To meet additional MSREE requirements:
Research Methods and Innovation sequence (REE 511, REE 512, REE 513)
Energy Engineering sequence (REE 515, REE 516, REE 517), approved specialization sequence, or technical electives
Graduate-level REE specialization sequence (REE 5xx, 5xx, 5xx)
Graduate-level REE specialization sequence (REE 5yy, 5yy, 5yy)

Concurrent Accelerated BSREE/MSE

Students enrolled in the BSREE program with a record of academic excellence have the option of earning both a BSREE and a MS Engineering (MSE) degree with an additional year of study. The MSE is a flexible multidisciplinary master's degree which is highly customizable to adapt to students' interests and industry needs. Students can select between different tracks or specialties, with the possibility of obtaining a more classical or more specialized graduate degree based on the track selected.

The accelerated and 4+1 options provide efficiency by allowing students to start their graduate level coursework in their senior year, and use some of these courses to simultaneously meet degree requirements for both the BS and MS programs. In the accelerated/concurrent program, students are awarded the BS and MSE degree concurrently at the end of their fifth year of study. On the other hand, in the 4+1 program, the BS degree is awarded in the fourth year, and the MSE degree is awarded in the fifth year. The accelerated option offers the most efficiency in terms of overall credit requirements. To be eligible for the accelerated and 4+1 options, students must have a cumulative GPA of 3.0, and apply for admission into the graduate program by the end of Spring term of their junior year.

Students pursuing the accelerated or 4+1 options follow the standard BSREE curriculum for the first three years, start their graduate coursework in their senior year, and complete the MSE requirements during their fifth (graduate) year, according to the following guidelines:

To meet BSREE requirements:
Replace 9 credits of undergraduate required or engineering elective courses with graduate-level courses (see MSE curriculum to select adequate courses based on desired MSE track)
Replace 3 terms of ENGR 465 with 3 terms of ENGR 597

To meet additional MSREE requirements:
Research Methods and Innovation sequence (ENGR 511, ENGR 512, ENGR 513)
Additional MSE required or elective courses (see MSE curriculum to select adequate courses based on desired MSE track)

Concurrent Accelerated BSREE/MSREE Program

Students pursuing this option follow the standard BSREE curriculum map during the first three years, start their graduate-level courses in the senior undergraduate year, and complete the MSREE requirements during their fifth (graduate) year, according to the following guidelines:

To meet BSREE requirements:
Replace 9 credits of REE senior sequence with one graduate-level REE sequence.
Replace 3 terms of ENGR 465 with 3 terms of Graduate Project (REE 599, 599, 599).

To meet additional MSREE requirements:
Research Methods and Innovation sequence (REE 511, REE 512, REE 513)
Energy Engineering sequence (REE 515, REE 516, REE 517), approved specialization sequence, or technical electives
Graduate-level REE specialization sequence (REE 5xx, 5xx, 5xx)
Graduate-level REE specialization sequence (REE 5yy, 5yy, 5yy)

Concurrent Degree in Electrical Engineering and Renewable Energy Engineering

To obtain both degrees (BSEE and BSREE) students must complete all of the courses required for the BSEE degree and the following BSREE courses. Consult with your advisor for details.

Curriculum

[a] Can be used to meet BSEE degree requirements.
Students must complete a minimum of 36 credit hours in addition to the BSEE degree requirements in order to get a second degree.
CHE 202 - General Chemistry II Credit Hours: 3 [a]
CHE 205 - General Chemistry II Lab Credit Hours: 1 [a]
CHE 260 - Electrochemistry for RE Applic Credit Hours: 4
EE 419 - Power Electronics Credit Hours: 4 [a]
ENGR 211 - Engineering Mechanics: Statics Credit Hours: 4
ENGR 355 - Thermodynamics Credit Hours: 3

HIST 356 - A History of Energy Credit Hours: 3 [a]
or
HIST 357 - History of the Electric Grid Credit Hours: 3 [a]

MECH 318 - Fluid Mechanics Credit Hours: 4
MECH 323 - Heat Transfer I Credit Hours: 3
REE 243 - Electrical Power Credit Hours: 4 [a]
REE 253 - Electromech Energy Conversion Credit Hours: 3
REE 33X - REE Elective Credit Hours: 3
REE 3XX - REE Elective Credit Hours: 3
REE 412 - Photovoltaic Systems Credit Hours: 3 [a]
REE 413 - Electric Power Conv Systems Credit Hours: 3
REE 463 - Energy Systems Instrumentation Credit Hours: 3
REE 4XX - REE Elective Credit Hours: 3

Concurrent Degree in Renewable Energy Engineering and Electrical Engineering

To obtain both degrees (BSREE and BSEE) students must complete all of the courses required for the BSREE degree and the following BSEE courses. Consult with your advisor for details.

Courses

CST 116 - C++ Programming I Credit Hours: 4
EE 323 - Electronics II Credit Hours: 5
EE 331 - Digital System Design w/HDL Credit Hours: 4
EE 333 - Intro to Microcontrollers Credit Hours: 4 [b]
EE 341 - Electricity/Magnetism w/Transm Credit Hours: 4 [b]
EE 343 - Solid State Electronic Devices Credit Hours: 3 [a]
EE 347 - Digital Logic Credit Hours: 4 [c]
EE 430 - Linear Sys & Digital Signal Credit Hours: 5
EE 335 - Advanced Microcontrollers Credit Hours: 4
MATH 253 - Sequences and Series Credit Hours: 4
MATH 465 - Mathematical Statistics Credit Hours: 4 [a]
MGT 345 - Engineering Economy Credit Hours: 3

Notes:

[a] MATH 465 can be used in place of MATH 361 to meet BSREE degree requirements. EE 343 can be used in place of REE 337 to meet BSREE degree requirements
[b] Can be used as Renewable Energy Engineering Electives
[c] Students can substitute with EE 131/EE 133 sequence
Students must complete a minimum of 36 credit hours in addition to the BSREE degree requirements in order to get a dual degree.

Concurrent Degree in Renewable Energy Engineering and Environmental Sciences

To obtain both degrees, students must complete the following listed courses along with the courses required for the Bachelor of Science in Renewable Energy Engineering.

Courses:

BIO 211 - Principles of Biology Credit Hours: 4
BIO 212 - Principles of Biology Credit Hours: 4
BIO 213 - Principles of Biology Credit Hours: 4
CHE 223 - General Chemistry III Credit Hours: 5 [a]
CHE 315 - Environmental Chem/Toxicology Credit Hours: 3
CHE 331 - Organic Chemistry I Credit Hours: 4
CHE 465 - Fate/Transport of Pollutants Credit Hours: 4
Ecology Elective Credit Hours: 4
ENV 111 - Intro to Env Sciences Credit Hours: 4
ENV 214 - Watershed Sci & Tech Credit Hours: 3
ENV 224 - Scientific Reason & Method Credit Hours: 3
ENV 314 - Env. Science, Law, & Policy Credit Hours: 3
ENV 484 - Sustainable Human Ecology Credit Hours: 4
MATH 362 - Statistical Methods II Credit Hours: 4

Total Additional Credits Needed: 53

[a] CHE 223 may be taken as BS Civil Engineering math/science elective

Electrical Engineering (Klamath Falls Campus), BS

Degree Requirements

The Bachelor of Science in Electrical Engineering follows a rigorous curriculum, requiring a minimum of 184 credit hours, which takes approximately four years to complete. To be eligible for graduation, students must maintain a 2.0 GPA. In addition, a final grade of "C" or better must be earned in all courses with CST, EE, ENGR, MATH, PHY prefixes, as well as in all technical elective courses.

All courses listed in the curriculum map for the catalog year of graduation must be completed to be eligible for graduation. Any deviations from the courses listed in the curriculum map require approval from the academic advisor, the department chair, and the Registrar's office. Approvals are not official until entered in the official student records. When changes are made to the curriculum, students who entered the program under a previous catalog will work with their academic advisors to transition to meet the requirements of the current catalog.

Curriculum Klamath Falls Campus

Required courses and recommended terms during which they should be taken:

Freshman Year Fall
CHE 201 - General Chemistry I Credit Hours: 3 [c]
CHE 204 - General Chemistry I Lab Credit Hours: 1 [c]
ENGR 101 - Intro to Engineering I Credit Hours: 2
MATH 251 - Differential Calculus Credit Hours: 4
SPE 111 - Public Speaking Credit Hours: 3
Total: 13 Credit Hours

Winter
CHE 202 - General Chemistry II Credit Hours: 3 [d]
CHE 205 - General Chemistry II Lab Credit Hours: 1 [d]
ENGR 102 - Intro to Engineering II Credit Hours: 2
MATH 252 - Integral Calculus Credit Hours: 4
PHY 221 - General Physics w/Calculus Credit Hours: 4
EE 131 - Digital Electronics I Credit Hours: 4
Total: 18 Credit Hours

Spring
EE 133 - Digital Electronics II Credit Hours: 4
MATH 254 - Vector Calculus I Credit Hours: 4
PHY 222 - General Physics w/Calculus Credit Hours: 4
WRI 121 - English Composition Credit Hours: 3
Total: 15 Credit Hours

Sophomore Year Fall
EE 221 - Circuits I Credit Hours: 4
PHY 223 - General Physics w/Calculus Credit Hours: 4
WRI 122 - Argumentative Writing Credit Hours: 3
Social Science Elective Credit Hours: 3
Total: 14 Credit Hours

Winter
CST 116 - C++ Programming I Credit Hours: 4
EE 223 - Circuits II Credit Hours: 4
MATH 321 - Appl Diff Equation I Credit Hours: 4
MATH 341 - Linear Algebra I Credit Hours: 4 [b]
Total: 16 Credit Hours

Spring
EE 225 - Circuits III Credit Hours: 4 [e]
MATH 253 - Sequences and Series Credit Hours: 4
WRI 227 - Technical Report Writing Credit Hours: 3
Humanities Elective Credit Hours: 3
Social Science Elective Credit Hours: 3
Total: 17 Credit Hours

Junior Year Fall
EE 321 - Electronics I Credit Hours: 5
EE 331 - Digital System Design w/HDL Credit Hours: 4
EE 341 - Electricity/Magnetism w/Transm Credit Hours: 4
MGT 345 - Engineering Economy Credit Hours: 3
Total: 16 Credit Hours

Winter
EE 323 - Electronics II Credit Hours: 5
EE 333 - Intro to Microcontrollers Credit Hours: 4
EE 343 - Solid State Electronic Devices Credit Hours: 3
MATH 465 - Mathematical Statistics Credit Hours: 4 [b]
Total: 16 Credit Hours

Spring
EE 335 - Advanced Microcontrollers Credit Hours: 4
EE 461 - Control Engineering I: Classical Methods Credit Hours: 4
ENGR 267 - Engineering Programming Credit Hours: 3
Engineering Elective Credit Hours: 4 [f]
Total: 15 Credit Hours

Senior Year Fall
EE 430 - Linear Sys & Digital Signal Credit Hours: 5
ENGR 465 - Capstone Project Credit Hours: 2
SPE 321 - Small Group/Team Comm Credit Hours: 3
Engineering Elective Credit Hours: 4 [f]
Social Science Elective Credit Hours: 3
Total: 17 Credit Hours

Winter
EE 401 - Communication Systems Credit Hours: 5
ENGR 465 - Capstone Project Credit Hours: 2
Engineering Elective Credit Hours: 3 [f]
Humanities Elective Credit Hours: 3
Upper Division Writing Elective Credit Hours: 3 [a]
Total: 16 Credit Hours

Spring
ENGR 465 - Capstone Project Credit Hours: 2
Engineering Elective Credit Hours: 3 [f]
Humanities Elective Credit Hours: 3
Social Science Elective Credit Hours: 3
Total: 11 Credit Hours

Total for a B.S. in Electrical Engineering: 184 Credit Hours

[a] Select from: WRI 327, WRI 350, or WRI 410
[b] MATH 341 can be replaced with MATH 261. MATH 465 can be replaced with MATH 361
[c] CHE 201/CHE 204 can be substituted with CHE 221
[d] Select from: CHE 202/205, CHE 222, MATH 322, MATH 327, MATH 342, MATH 354, MATH 421, MATH 451, MATH 454, PHY 410, PHY 448, PHY 449, PHY 450, PHY 451, PHY 452, PHY 453, or an advisor approved Math/Science elective
[e] EE 225 can be substituted with EE 320
[f] Technical electives include upper division EE and REE courses (except EE 311, EE 320, EE 347, and EE 431), and courses listed for a specific BSEE technical emphasis. Other courses may be used with advisor approval

Technical Emphases

Students in the BSEE program may choose to specialize in a particular area by selecting at least three of their engineering technical elective courses from the appropriate list below. These lists of courses are provided only for guidance. Students are not required to select a technical emphasis, and technical emphases will not appear on the students' transcripts. Some technical elective courses in the emphases may not be available in both campuses. Check course offerings with your advisor.

Electrical Power

Choose at least three engineering elective courses from the following list:
EE 419 - Power Electronics Credit Hours: 4
REE 243 - Electrical Power Credit Hours: 4
REE 253 - Electromech Energy Conversion Credit Hours: 3
REE 345 - Wind Power Credit Hours: 3
REE 453 - Power System Analysis Credit Hours: 3
REE 454 - Power Syst Protection & Ctnrl Credit Hours: 3
or other approved technical Electives

Microelectronics

Choose at least three engineering elective courses from the following list:
EE 325 - Electronics III Credit Hours: 5
EE 421 - Analog Intgrted - Circuit Dsgn Credit Hours: 5
EE 423 - CMOS Digital Intg Circuit Dsgn Credit Hours: 5
EE 432 - Advanced Digital System Design Credit Hours: 4
or other approved technical Electives

Renewable Energy

Choose at least three engineering elective courses from the following list:
EE 419 - Power Electronics Credit Hours: 4
REE 243 - Electrical Power Credit Hours: 4
REE 253 - Electromech Energy Conversion Credit Hours: 3
REE 345 - Wind Power Credit Hours: 3
REE 346 - Biofuels and Biomass Credit Hours: 3
REE 412 - Photovoltaic Systems Credit Hours: 3
REE 413 - Electric Power Conv Systems Credit Hours: 3
REE 425 - Electricity Markets & Modeling Credit Hours: 3
REE 427 - Greenhouse Gas Acct/Footprints Credit Hours: 3
or other approved technical Electives

Robotics, Autonomous Systems, and Control Engineering

Choose at least three engineering elective courses from the following list:
ENGR 461 - Modeling and Simulation of Dynamic Systems Credit Hours: 4
ENGR 463 - Motion Control in Mechanisms and Robotics Credit Hours: 4
ENGR 464 - Autonomous Systems Credit Hours: 4
REE 463 - Energy Systems Instrumentation Credit Hours: 3
or other approved technical Electives

Note: Optical Engineering emphasis only available at the Portland-Metro campus.

Electrical Engineering (Portland-Metro Campus), BS

Degree Requirements

The Bachelor of Science in Electrical Engineering follows a rigorous curriculum, requiring a minimum of 184 credit hours, which takes approximately four years to complete. To be eligible for graduation, students must maintain a 2.0 GPA. In addition, a final grade of "C" or better must be earned in all courses with CST, EE, ENGR, MATH, PHY prefixes, as well as in all technical elective courses.

All courses listed in the curriculum map for the catalog year of graduation must be completed to be eligible for graduation. Any deviations from the courses listed in the curriculum map require approval from the academic advisor, the department chair, and the Registrar's office. Approvals are not official until entered in the official student records. When changes are made to the curriculum, students who entered the program under a previous catalog will work with their academic advisors to transition to meet the requirements of the current catalog.

Note: The Portland-Metro campus is a laptop-required campus with resources like laptop specifications, financial aid, and helpful instructions found at http://www.oit.edu/portland-metro/college-costs/bring-your-own-device.

Curriculum – Portland-Metro Campus

Required courses and recommended terms during which they should be taken:

Freshman Year Fall
CHE 201 - General Chemistry I Credit Hours: 3 [c]
CHE 204 - General Chemistry I Lab Credit Hours: 1 [c]
EE 131 - Digital Electronics I Credit Hours: 4
MATH 251 - Differential Calculus Credit Hours: 4
WRI 121 - English Composition Credit Hours: 3
Total: 15 Credit Hours

Winter
CHE 202 - General Chemistry II Credit Hours: 3 [d]
CHE 205 - General Chemistry II Lab Credit Hours: 1 [d]
EE 133 - Digital Electronics II Credit Hours: 4
MATH 252 - Integral Calculus Credit Hours: 4
WRI 122 - Argumentative Writing Credit Hours: 3
Social Science Elective Credit Hours: 3
Total: 18 Credit Hours

Spring
MATH 321 - Appl Diff Equation I Credit Hours: 4
MATH 254 - Vector Calculus I Credit Hours: 4
MGT 345 - Engineering Economy Credit Hours: 3
SPE 111 - Public Speaking Credit Hours: 3
Humanities Elective Credit Hours: 3
Total: 17 Credit Hours

Sophomore Year Fall
CST 116 - C++ Programming I Credit Hours: 4
EE 221 - Circuits I Credit Hours: 4
PHY 221 - General Physics w/Calculus Credit Hours: 4
WRI 227 - Technical Report Writing Credit Hours: 3
Total: 15 Credit Hours

Winter
EE 223 - Circuits II Credit Hours: 4
ENGR 267 - Engineering Programming Credit Hours: 3
MATH 341 - Linear Algebra I Credit Hours: 4 [b]
PHY 222 - General Physics w/Calculus Credit Hours: 4
Humanities Elective Credit Hours: 3
Total: 18 Credit Hours

Spring
EE 225 - Circuits III Credit Hours: 4 [e]
MATH 253 - Sequences and Series Credit Hours: 4
PHY 223 - General Physics w/Calculus Credit Hours: 4
Social Science Elective Credit Hours: 3
Total: 15 Credit Hours

Junior Year Fall
EE 321 - Electronics I Credit Hours: 5
EE 333 - Intro to Microcontrollers Credit Hours: 4
EE 341 - Electricity/Magnetism w/Transm Credit Hours: 4
SPE 321 - Small Group/Team Comm Credit Hours: 3
Total: 16 Credit Hours

Winter
EE 323 - Electronics II Credit Hours: 5
EE 331 - Digital System Design w/HDL Credit Hours: 4
EE 335 - Advanced Microcontrollers Credit Hours: 4
Social Science Elective Credit Hours: 3
Total: 16 Credit Hours

Spring
EE 343 - Solid State Electronic Devices Credit Hours: 3
EE 432 - Advanced Digital System Design Credit Hours: 4 [f]
Engineering Elective Credit Hours: 4 [g]
Upper Division Writing Elective Credit Hours: 3 [a]
Total: 14 Credit Hours

Senior Year Fall
EE 461 - Control Engineering I: Classical Methods Credit Hours: 4
ENGR 465 - Capstone Project Credit Hours: 2
MATH 465 Mathematical Statistics Credit Hours: 4 [b]
Engineering Elective Credit Hours: 4 [g]
Total: 14 Credit Hours

Winter
EE 430 - Linear Sys & Digital Signal Credit Hours: 5
ENGR 465 - Capstone Project Credit Hours: 2
Engineering Elective Credit Hours: 3 [g]
Humanities Elective Credit Hours: 3
Total: 13 Credit Hours

Spring
EE 401 - Communication Systems Credit Hours: 5
ENGR 465 - Capstone Project Credit Hours: 2
Engineering Elective Credit Hours: 3 [g]
Social Science Elective Credit Hours: 3
Total: 13 Credit Hours

Total for a B.S. in Electrical Engineering: 184 Credit Hours

[a] Select from: WRI 327, WRI 350, or WRI 410
[b] MATH 341 can be replaced with MATH 261. MATH 465 can be replaced with MATH 361
[c] CHE 201/CHE 204 can be substituted with CHE 221
[d] Select from: CHE 202/205, CHE 222, MATH 322, MATH 327, MATH 342, MATH 354, MATH 421, MATH 451, MATH 454, PHY 410, PHY 448, PHY 449, PHY 450, PHY 451, PHY 452, PHY 453, or an advisor approved Math/Science elective

[e] EE 225 can be substituted with EE 320
[f] EE 207 Engineering Design and Invention, EE 432, or other advisor approved technical elective
[g] Technical electives include upper division EE and REE courses (except EE 311, EE 320, EE 347, and EE 431), and courses listed for a specific BSEE technical emphasis. Other courses may be used with advisor approval

Technical Emphases

Students in the BSEE program may choose to specialize in a particular area by selecting at least three of their engineering technical elective courses from the appropriate list below. These lists of courses are provided only for guidance. Students are not required to select a technical emphasis, and technical emphases will not appear on the students' transcripts. Some technical elective courses in the emphases may not be available in both campuses. Check course offerings with your advisor.

Electrical Power
Choose at least three engineering elective courses from the following list:
EE 419 - Power Electronics Credit Hours: 4
REE 243 - Electrical Power Credit Hours: 4
REE 253 - Electromech Energy Conversion Credit Hours: 3
REE 345 - Wind Power Credit Hours: 3
REE 453 - Power System Analysis Credit Hours: 3
REE 454 - Power Syst Protection & Ctnrl Credit Hours: 3
or other approved Technical Electives

Microelectronics
Choose at least three engineering elective courses from the following list:
EE 325 - Electronics III Credit Hours: 5
EE 421 - Analog Intgrted - Circuit Dsgn Credit Hours: 5
EE 423 - CMOS Digital Intg Circuit Dsgn Credit Hours: 5
EE 432 - Advanced Digital System Design Credit Hours: 4
or other approved Technical Electives

Optical Engineering
Choose at least three engineering elective courses from the following list:
EE 448 - Geometric Optics Credit Hours: 4
EE 449 - Radiometry & Optical Detect Credit Hours: 4
EE 450 - Physical Optics Credit Hours: 4
EE 451 - Lasers Credit Hours: 4
EE 452 - Waveguides and Fiber Optics Credit Hours: 4
EE 453 - Optical Metrology Credit Hours: 4
or other approved Technical Electives

Renewable Energy
Choose at least three engineering elective courses from the following list:
EE 419 - Power Electronics Credit Hours: 4
REE 243 - Electrical Power Credit Hours: 4
REE 253 - Electromech Energy Conversion Credit Hours: 3
REE 345 - Wind Power Credit Hours: 3
REE 346 - Biofuels and Biomass Credit Hours: 3
REE 412 - Photovoltaic Systems Credit Hours: 3
REE 413 - Electric Power Conv Systems Credit Hours: 3
REE 425 - Electricity Markets & Modeling Credit Hours: 3
REE 427 - Greenhouse Gas Acct/Footprints Credit Hours: 3
or other approved Technical Electives

Robotics, Autonomous Systems, and Control Engineering
Choose at least three engineering elective courses from the following list:
ENGR 461 - Modeling and Simulation of Dynamic Systems Credit Hours: 4
ENGR 463 - Motion Control in Mechanisms and Robotics Credit Hours: 4
ENGR 464 - Autonomous Systems Credit Hours: 4
REE 463 - Energy Systems Instrumentation Credit Hours: 3
or other approved Technical Electives

Note: Optical Engineering emphasis only available at the Portland-Metro campus.

Electrical Engineering (Post-Baccalaureate), BS

The following is a list of additional courses that Oregon Tech BSEET graduates are required to complete in order to meet the BSEE degree requirements.

Curriculum

Mathematics and Science

CHE 201 - General Chemistry I Credit Hours: 3 [a]
CHE 204 - General Chemistry I Lab Credit Hours: 1 [a]
CHE 202 - General Chemistry II Credit Hours: 3 [a]
CHE 205 - General Chemistry II Lab Credit Hours: 1 [a]
MATH 253 - Sequences and Series Credit Hours: 4
MATH 341 - Linear Algebra I Credit Hours: 4
MATH 465 - Mathematical Statistics Credit Hours: 4

Electrical Engineering

EE 341 - Electricity/Magnetism w/Transm Credit Hours: 4
EE 343 - Solid State Electronic Devices Credit Hours: 3

Engineering Technical Electives

Engineering Elective (EE, REE) Credit Hours: 3 [b]
Engineering Elective (EE, REE) Credit Hours: 3 [b]

Total needed if a BSEET degree awarded by Oregon Tech: 36 Credit Hours

Additional credits needed for students who completed a BSEET degree from another institution: 45 Credit Hours

Engineering Elective (EE, REE) Credit Hours: 3 [b]
Engineering Elective (EE, REE) Credit Hours: 3 [b]
Engineering Elective (EE, REE) Credit Hours: 3 [b]

[a] CHE 201/CHE 204 and CHE 202/CHE 205 can be substituted with CHE 221 and CHE 222 respectively. CHE 202/CHE 205 can be substituted with an approved 4 credit Math/Science Elective
[b] Requires approval

Electronics Engineering Technology, BS

Degree Requirements

The Bachelor of Science in Electronics Engineering Technology follows a rigorous curriculum, requiring a minimum of 188 credit hours, which takes approximately four years to complete. To be eligible for graduation, students must maintain a 2.0 GPA. In addition, a final grade of "C" or better must be earned in all courses with CST, EE, ENGR, MATH, PHY prefixes, as well as in all technical elective courses.

All courses listed in the curriculum map for the catalog year of graduation must be completed to be eligible for graduation. Any deviations from the courses listed in the curriculum map require approval from the academic advisor, the department chair, and the Registrar's office. Approvals are not official until entered in the official student records. When changes are made to the curriculum, students who entered the program under a previous catalog will work with their academic advisors to transition to meet the requirements of the current catalog.

Curriculum

The curriculum map below shows the required courses, recommended sequence, and recommended terms during which they should be taken for students transferring into the program with an accredited AAS degree or equivalent lower division coursework (freshman and sophomore years).

Transfer students and part-time students should contact the BSEET program director to develop a customized curriculum tailored to their individual needs.

Freshman and Sophomore Years

The degree requirements for the first two years can be fulfilled by completing an accredited Associate of Applied Science degree in Electronics Engineering Technology, Microelectronics Engineering Technology, Microelectronics Technology, Electrical Engineering Transfer, Renewable Energy Technology, or equivalent coursework. Oregon Tech has articulation agreements with various community colleges throughout Oregon. Students transferring to Oregon Tech with an AAS degree from these programs will not be required to take any lower-division electronics courses at Oregon Tech. In addition to the electronics courses, students should complete the programming, math and science, communication, and general education courses specified below during the Freshman and Sophomore years while completing their AAS degree in order to be able to complete the upper-division (Junior and Senior) BSEET courses at Oregon Tech in two years. Below is a list of courses to satisfy the requirements for the first two years of the degree. Completion of all these courses is not required to be able to transfer, but it is recommended for 2+2 transferability.

Communication
SPE 111 - Public Speaking Credit Hours: 3
WRI 121 - English Composition Credit Hours: 3
WRI 122 - Argumentative Writing Credit Hours: 3
WRI 227 - Technical Report Writing Credit Hours: 3
Total: 12 Credit Hours

General Education
Humanities Elective Credit Hours: 9
Social Science Elective Credit Hours: 12
Total: 21 Credit Hours

Mathematics and Science
MATH 111 - College Algebra Credit Hours: 4
MATH 112 - Trigonometry Credit Hours: 4
MATH 251 - Differential Calculus Credit Hours: 4
MATH 252 - Integral Calculus Credit Hours: 4
PHY 221 - General Physics w/Calculus Credit Hours: 4
PHY 222 - General Physics w/Calculus Credit Hours: 4
HY 223 - General Physics w/Calculus Credit Hours: 4
Statistics Elective Credit Hours: 4 [a]
Total: 32 Credit Hours

Electronics
EE 121 - Fund of Electric Circuits I Credit Hours: 4
EE 123 - Fund of Electic Circuits II Credit Hours: 4
EE 131 - Digital Electronics I Credit Hours: 4
EE 133 - Digital Electronics II Credit Hours: 4
EE 219 - Intro Semiconduct Device & Amp Credit Hours: 4
200-level Technical Electives Credit Hours: 16 [b]
Total: 36 Credit Hours

Programming
CST 116 - C++ Programming I Credit Hours: 4
Total: 4 Credit Hours

Upper Division Courses

Junior Year Fall

EE 320 - Adv Circuit Systems Analysis Credit Hours: 5 [e]
EE 321 - Electronics I Credit Hours: 5
MATH 321 - Appl Diff Equation I Credit Hours: 4
MGT 345 - Engineering Economy Credit Hours: 3
Total: 17 Credit Hours

Winter
EE 323 - Electronics II Credit Hours: 5
EE 331 - Digital System Design w/HDL Credit Hours: 4
ENGR 267 - Engineering Programming Credit Hours: 3
SPE 321 - Small Group/Team Comm Credit Hours: 3
Total: 15 Credit Hours

Spring
EE 325 - Electronics III Credit Hours: 5
EE 432 - Advanced Digital System Design Credit Hours: 4 [e]
MATH 254 - Vector Calculus I Credit Hours: 4
Total: 12 Credit Hours

Senior Year Fall
EE 333 - Intro to Microcontrollers Credit Hours: 4
ENGR 465 - Capstone Project Credit Hours: 2
Engineering Elective Credit Hours: 3 [d]
Upper Division Writing Elective Credit Hours: 3
Total: 12 Credit Hours

Winter
EE 335 - Advanced Microcontrollers Credit Hours: 4
EE 430 - Linear Sys & Digital Signal Credit Hours: 5
ENGR 465 - Capstone Project Credit Hours: 2
Engineering Elective Credit Hours: 3 [d]
Total: 14 Credit Hours

Spring
EE 401 - Communication Systems Credit Hours: 5
ENGR 465 - Capstone Project Credit Hours: 2
Engineering Elective Credit Hours: 3 [b]
Elective Credit Hours: 2
Total: 13 Credit Hours

Total for a B.S. in Electronics Engineering Technology: 188 Credit Hours

[a] Choose from MATH 243, MATH 361, and MATH 465.
[b] Lower Division Technical electives include CST 126, CST 136, and other approved 200-level engineering or engineering technology courses.
[c] Choose from WRI 327, WRI 350, and WRI 410.
[d] Upper division EE or REE courses (except EE 311, EE 320, and EE 347), or courses included in the list for a specific degree option (students must satisfy course pre- and co-requisites). Other courses may be used as engineering electives with advisor and department chair approval. Students must complete a minimum of 9 credits of engineering elective coursework.
[e] EE 320 can be substituted with EE 225. EE 432 can be substituted with an approved technical elective.

Technical Emphases

Students in the BSEET program may choose to specialize in a particular area by selecting their engineering elective courses from the appropriate list below. These lists of courses are provided only for guidance. Students are not required to select a technical emphasis, and technical emphases will not appear on the students' transcripts. Some technical elective courses in the emphases may not be available in both campuses. Check course offerings with your advisor.

Electrical Power
Choose technical elective courses from the following list:
EE 419 - Power Electronics Credit Hours: 4
REE 243 - Electrical Power Credit Hours: 4
REE 253 - Electromech Energy Conversion Credit Hours: 3
REE 345 - Wind Power Credit Hours: 3
REE 453 - Power System Analysis Credit Hours: 3
REE 454 - Power Syst Protection & Ctnrl Credit Hours: 3
or approved technical electives

Microelectronics
Choose technical elective courses from the following list:
EE 341 - Electricity/Magnetism w/Transm Credit Hours: 4
EE 343 - Solid State Electronic Devices Credit Hours: 3
EE 421 - Analog Intgrted - Circuit Dsgn Credit Hours: 5
EE 423 - CMOS Digital Intg Circuit Dsgn Credit Hours: 5
or approved technical electives

Optical Engineering
Choose technical elective courses from the following list:
EE 448 - Geometric Optics Credit Hours: 4
EE 449 - Radiometry & Optical Detect Credit Hours: 4
EE 450 - Physical Optics Credit Hours: 4
EE 451 - Lasers Credit Hours: 4
EE 452 - Waveguides and Fiber Optics Credit Hours: 4
EE 453 - Optical Metrology Credit Hours: 4
or approved technical electives

Note: Optical Engineering emphasis only available at Portland-Metro campus.

Renewable Energy
Choose technical elective courses from the following list:
EE 419 - Power Electronics Credit Hours: 4
REE 243 - Electrical Power Credit Hours: 4
REE 253 - Electromech Energy Conversion Credit Hours: 3
REE 345 - Wind Power Credit Hours: 3
REE 346 - Biofuels and Biomass Credit Hours: 3
REE 412 - Photovoltaic Systems Credit Hours: 3
REE 413 - Electric Power Conv Systems Credit Hours: 3
REE 425 - Electricity Markets & Modeling Credit Hours: 3
REE 427 - Greenhouse Gas Acct/Footprints Credit Hours: 3
or advisor approved technical electives

Robotics, Autonomous Systems, and Control Engineering
Choose technical Elective courses from the following list:
ENGR 461 - Modeling and Simulation of Dynamic Systems Credit Hours: 4
ENGR 463 - Motion Control in Mechanisms and Robotics Credit Hours: 4
ENGR 464 - Autonomous Systems Credit Hours: 4
REE 463 - Energy Systems Instrumentation Credit Hours: 3
or other approved technical electives

Note: Robotics, Autonomous Systems, and Control Engineering emphasis only available at Portland-Metro campus.

Renewable Energy Engineering (Klamath Falls Campus), BS

Degree Requirements

The Bachelor of Science in Renewable Energy Engineering follows a rigorous curriculum, requiring a minimum of 184/185 credit hours, which takes approximately four years to complete. To be eligible for graduation, students must maintain a 2.0 GPA. In addition, a final grade of "C" or better must be earned in all courses with MATH, CHE, PHY, EE, ENGR, MECH, and REE prefixes. Students must also earn a grade of "C" or better in all courses listed as prerequisites for these courses.

All courses listed in the curriculum map for the catalog year of graduation must be completed to be eligible for graduation. Any deviations from the courses listed in the curriculum map require approval from the academic advisor, the department chair, and the Registrar's office. Approvals are not official until entered in the official student records. When changes are made to the curriculum, students who entered the program under a previous catalog will work with their academic advisors to transition to meet the requirements of the current catalog.

Curriculum – Klamath Falls Campus

Required courses and recommended terms during which they should be taken:

Freshman Year Fall
CHE 201 - General Chemistry I Credit Hours: 3 [a]
CHE 204 - General Chemistry I Lab Credit Hours: 1 [a]
ENGR 101 - Intro to Engineering I Credit Hours: 2 [d]
MATH 251 - Differential Calculus Credit Hours: 4
WRI 121 - English Composition Credit Hours: 3
Total: 13 Credit Hours

Winter
CHE 202 - General Chemistry II Credit Hours: 3 [a]
CHE 205 - General Chemistry II Lab Credit Hours: 1 [a]
ENGR 102 - Intro to Engineering II Credit Hours: 2 [d]
MATH 252 - Integral Calculus Credit Hours: 4
WRI 122 - Argumentative Writing Credit Hours: 3
Social Science Elective Credit Hours: 3
Total: 16 Credit Hours

Spring
CHE 260 - Electrochemistry for RE applic Credit Hours: 4
ENGR 267 - Engineering Programming Credit Hours: 3
MATH 254 - Vector Calculus I Credit Hours: 4
SPE 111 - Public Speaking Credit Hours: 3
WRI 227 - Technical Report Writing Credit Hours: 3
Total: 17 Credit Hours

Sophomore Year Fall
ECO 201 - Principles of Microeconomics Credit Hours: 3
or
ECO 202 - Principles of Macroeconomics Credit Hours: 3

EE 221 - Circuits I Credit Hours: 4
MATH 321 - Appl Diff Equation I Credit Hours: 4
PHY 221 - General Physics w/Calculus Credit Hours: 4
Total: 15 Credit Hours

Winter
EE 223 - Circuits II Credit Hours: 4
ENGR 211 - Engineering Mechanics: Statics Credit Hours: 4

HIST 356 - A History of Energy Credit Hours: 3
or
HIST 357 - History of the Electric Grid Credit Hours: 3

PHY 222 - General Physics w/Calculus Credit Hours: 4
Total: 15 Credit Hours

Spring
EE 225 - Circuits III Credit Hours: 4

MATH 361 - Statistical Methods I Credit Hours: 4
or
MATH 465 - Mathematical Statistics Credit Hours: 4

PHY 223 - General Physics w/Calculus Credit Hours: 4
REE 243 - Electrical Power Credit Hours: 4
Total: 16 Credit Hours

Junior Year Fall
EE 321 - Electronics I Credit Hours: 5

MATH 261 - Intro to Linear Algebra Credit Hours: 4
or
MATH 341 - Linear Algebra I Credit Hours: 4

MECH 318 - Fluid Mechanics Credit Hours: 4
or
ENGR 318 - Engineering Mech: Fluids Credit Hours: 4

REE 253 - Electromech Energy Conversion Credit Hours: 3
Total: 16 Credit Hours

Winter
REE 337 - Materials for RE Applications Credit Hours: 3
or
EE 343 - Solid State Electronic Devices Credit Hours: 3

EE 461 - Control Engineering I: Classical Methods Credit Hours: 4
ENGR 355 - Thermodynamics Credit Hours: 3
Upper Division Writing Elective Credit Hours: 3 [c]
Renewable Energy Engineering Elective Credit Hours: 3
Total: 16 Credit Hours

Spring
EE 419 - Power Electronics Credit Hours: 4
MECH 323 - Heat Transfer I Credit Hours: 3
REE 331 - Fuel Cells Credit Hours: 3
SPE 321 - Small Group/Team Comm Credit Hours: 3
Renewable Energy Engineering Elective Credit Hours: 3
Total: 16 Credit Hours

Senior Year Fall
ENGR 465 - Capstone Project Credit Hours: 2
REE 4XX - Senior Sequence I Credit Hours: 3
REE 412 - Photovoltaic Systems Credit Hours: 3
Renewable Energy Engineering Elective Credit Hours: 3
Humanities Elective Credit Hours: 3
Social Science Elective Credit Hours: 3
Total: 17 Credit Hours

Winter
ENGR 465 - Capstone Project Credit Hours: 2
REE 4XX - Senior Sequence II Credit Hours: 3
EE 413 - Electric Power Conv Systems Credit Hours: 3
Renewable Energy Engineering Elective Credit Hours: 3
Humanities Elective Credit Hours: 3
Total: 14 Credit Hours

Spring
ENGR 465 - Capstone Project Credit Hours: 2
REE 4XX - Senior Sequence III Credit Hours: 3
REE 463 - Energy Systems Instrumentation Credit Hours: 3
Renewable Energy Engineering Elective Credit Hours: 3
Humanities Elective Credit Hours: 3
Total: 14 Credit Hours

Total for a B.S. in Renewable Energy Engineering: 185 Credit Hours

[a] CHE 201/CHE 204 and CHE 202/CHE 205 can be substituted with CHE 221 and CHE 222 respectively
[b] Course may be repeated multiple times for credit with approval
[c] Choose from WRI 327, WRI 350, and WRI 410
[d] With advisor approval students may take REE 201 in place of ENGR 101 and ENGR 102

Renewable Energy Engineering Electives

Students in the BSREE program are required to complete 15 credits of technical electives classes. At least 3 of these classes must be REE 300-level or above and up to two courses from the following list: 300- or 400-level EE courses (except for EE 320), ENGR42X, or SEM42X. No more than three 1-credit courses are allowed. Enrollment in graduate-level courses at the undergraduate level requires special approval. Examples of acceptable elective courses are:
EE 341 - Electricity/Magnetism w/Transm Credit Hours: 4
EE 347 - Digital Logic Credit Hours: 4
EE 343 - Solid State Electronic Devices Credit Hours: 3
MECH 433 - HVAC Credit Hours: 3
REE 331 - Fuel Cells Credit Hours: 3
REE 333 - Batteries Credit Hours: 3
REE 335 - Hydrogen Credit Hours: 3
REE 337 - Materials for RE Applications Credit Hours: 3
REE 344 - Nuclear Energy Credit Hours: 3
REE 345 - Wind Power Credit Hours: 3
REE 346 - Biofuels and Biomass Credit Hours: 3
REE 347 - Hydroelectric Power Credit Hours: 3
REE 348 - Solar Thermal Energy Systems Credit Hours: 3

REE 307 - Seminar Credit Hours: 12 [b]
or
REE 407 - Seminar Credit Hours: 12 [b]

REE 425 - Electricity Markets & Modeling Credit Hours: 3
REE 427 - Greenhouse Gas Acct/Footprints Credit Hours: 3
REE 439 - Energy Systems Auditing and Management Credit Hours: 3
REE 451 - Geo Enrgy & direct use app Credit Hours: 3
REE 453 - Power System Analysis Credit Hours: 3
REE 454 - Power Syst Protection & Ctnrl Credit Hours: 3
REE 455 - Energy Efficient Building Dsgn Credit Hours: 3
REE 465 - Renewable Energy Transport Sys Credit Hours: 3
REE 469 - Grid Integration of Renewables Credit Hours: 3

Senior Sequences:
With approval, students can complete a graduate-level REE sequence to meet the senior sequence requirement. Enrollment in graduate-level courses at the undergraduate level requires special approval.

Students are required to complete a minimum of one sequence of technical courses (all three courses) from the list below:

Green Building:
MECH 433 - HVAC Credit Hours: 3
REE 439 - Energy Systems Auditing and Management Credit Hours: 3
REE 455 - Energy Efficient Building Dsgn Credit Hours: 3

Power Systems:
REE 453 - Power System Analysis Credit Hours: 3
REE 454 - Power Syst Protection & Ctnrl Credit Hours: 3
REE 469 - Grid Integration of Renewables Credit Hours: 3

Geothermal:
REE 431 - Geotherm Heat Pump Desgn Credit Hours: 3
REE 451 - Geo Enrgy & direct use app Credit Hours: 3
REE 471 - Geothermal Powr Plnt Desgn Credit Hours: 3

Renewable Energy Engineering (Portland-Metro Campus), BS

Degree Requirements

The Bachelor of Science in Renewable Energy Engineering follows a rigorous curriculum, requiring a minimum of 184/185 credit hours, which takes approximately four years to complete. To be eligible for graduation, students must maintain a 2.0 GPA. In addition, a final grade of "C" or better must be earned in all courses with MATH, CHE, PHY, EE, ENGR, MECH, and REE prefixes. Students must also earn a grade of "C" or better in all courses listed as prerequisites for these courses.

All courses listed in the curriculum map for the catalog year of graduation must be completed to be eligible for graduation. Any deviations from the courses listed in the curriculum map require approval from the academic advisor, the department chair, and the Registrar's office. Approvals are not official until entered in the official student records. When changes are made to the curriculum, students who entered the program under a previous catalog will work with their academic advisors to transition to meet the requirements of the current catalog.

Note: The Portland-Metro campus is a laptop-required campus with resources like laptop specifications, financial aid, and helpful instructions found at http://www.oit.edu/portland-metro/college-costs/bring-your-own-device.

Curriculum – Portland-Metro Campus

Required courses and recommended terms during which they should be taken:

Freshman Year Fall
CHE 201 - General Chemistry I Credit Hours: 3 [a]
CHE 204 - General Chemistry I Lab Credit Hours: 1 [a]
REE 201 - Intro to Renewable Energy Credit Hours: 3
MATH 251 - Differential Calculus Credit Hours: 4
WRI 121 - English Composition Credit Hours: 3
Total: 14 Credit Hours

Winter
CHE 202 - General Chemistry II Credit Hours: 3 [a]
CHE 205 - General Chemistry II Lab Credit Hours: 1 *

ECO 201 - Principles of Microeconomics Credit Hours: 3
or
ECO 202 - Principles of Macroeconomics Credit Hours: 3

MATH 252 - Integral Calculus Credit Hours: 4
WRI 122 - Argumentative Writing Credit Hours: 3
Total: 14 Credit Hours

Spring
MATH 254 - Vector Calculus I Credit Hours: 4
CHE 260 - Electrochemistry for RE applic Credit Hours: 4
SPE 111 - Public Speaking Credit Hours: 3
WRI 227 - Technical Report Writing Credit Hours: 3
Social Science Elective Credit Hours: 3
Total: 17 Credit Hours

Sophomore Year Fall
EE 221 - Circuits I Credit Hours: 4

MATH 361 - Statistical Methods I Credit Hours: 4
or
MATH 465 - Mathematical Statistics Credit Hours: 4

PHY 221 - General Physics w/Calculus Credit Hours: 4
Upper Division Writing Elective Credit Hours: 3 [c]
Total: 15 Credit Hours

Winter
EE 223 - Circuits II Credit Hours: 4
ENGR 267 - Engineering Programming Credit Hours: 3

MATH 261 Intro to Linear Algebra Credit Hours: 4
or
MATH 341 - Linear Algebra I Credit Hours: 4

PHY 222 - General Physics w/Calculus Credit Hours: 4
Total: 15 Credit Hours

Spring
EE 225 - Circuits III Credit Hours: 4
MATH 321 - Appl Diff Equation I Credit Hours: 4
PHY 223 - General Physics w/Calculus Credit Hours: 4
REE 243 - Electrical Power Credit Hours: 4
Total: 16 Credit Hours

Junior Year Fall
EE 321 - Electronics I Credit Hours: 5
ENGR 211 - Engineering Mechanics: Statics Credit Hours: 4
ENGR 355 - Thermodynamics Credit Hours: 3

REE 337 - Materials for RE Applications Credit Hours: 3
or
EE 343 - Solid State Electronic Devices Credit Hours: 3

SPE 321 - Small Group/Team Comm Credit Hours: 3
Total: 18 Credit Hours

Winter
HIST 356 - A History of Energy Credit Hours: 3
or
HIST 357 - History of the Electric Grid Credit Hours: 3

MECH 318 - Fluid Mechanics Credit Hours: 4
or
ENGR 318 - Engineering Mech: Fluids Credit Hours: 4

REE 412 - Photovoltaic Systems Credit Hours: 3
REE 463 - Energy Systems Instrumentation Credit Hours: 3
Humanities Elective Credit Hours: 3
Total: 16 Credit Hours

Spring
EE 461 - Control Engineering I: Classical Methods Credit Hours: 4
MECH 323 - Heat Transfer I Credit Hours: 3
REE 253 - Electromech Energy Conversion Credit Hours: 3
REE 42X - Global Energy Issues Elective Credit Hours: 3
Social Science Elective Credit Hours: 3
Total: 16 Credit Hours

Senior Year Fall
ENGR 465 - Capstone Project Credit Hours: 2
REE 331 - Fuel Cells Credit Hours: 3
REE 4XX - Senior Sequence I Credit Hours: 3
REE XXX - Thermal Energy Elective Credit Hours: 3
Renewable Energy Engineering Elective Credit Hours: 3
Total: 14 Credit Hours

Winter
EE 419 - Power Electronics Credit Hours: 4
ENGR 465 - Capstone Project Credit Hours: 2
REE 4XX - Senior Sequence II Credit Hours: 3
Renewable Energy Engineering Elective Credit Hours: 3
Humanities Elective Credit Hours: 3
Total: 15 Credit Hours

Spring
ENGR 465 - Capstone Project Credit Hours: 2
REE 4XX - Senior Sequence III Credit Hours: 3
REE 413 - Electric Power Conv Systems Credit Hours: 3
REE 3XX - Hydro Energy Elective Credit Hours: 3
Humanities Elective Credit Hours: 3
Total: 14 Credit Hours

Total for a B.S. in Renewable Energy Engineering: 184 Credit Hours

[a] CHE 201/CHE 204 and CHE 202/CHE 205 can be substituted with CHE 221 and CHE 222 respectively
[b] Course may be repeated multiple times for credit with approval
[c] Choose from WRI 327, WRI 350, and WRI 410

Renewable Energy Engineering Electives

Students in the BSREE program are required to complete 15 credits of technical electives classes. At least 3 of these classes must be REE 300-level or above and up to two courses from the following list: 300- or 400-level EE courses (except for EE 320), ENGR42X, or SEM42X. No more than three 1-credit courses are allowed. Enrollment in graduate-level courses at the undergraduate level requires special approval. Examples of acceptable elective courses are:
EE 341 - Electricity/Magnetism w/Transm Credit Hours: 4
EE 347 - Digital Logic Credit Hours: 4
EE 343 - Solid State Electronic Devices Credit Hours: 3
MECH 433 - HVAC Credit Hours: 3
REE 331 - Fuel Cells Credit Hours: 3
REE 333 - Batteries Credit Hours: 3
REE 335 - Hydrogen Credit Hours: 3
REE 337 - Materials for RE Applications Credit Hours: 3
REE 344 - Nuclear Energy Credit Hours: 3
REE 345 - Wind Power Credit Hours: 3
REE 346 - Biofuels and Biomass Credit Hours: 3
REE 347 - Hydroelectric Power Credit Hours: 3
REE 348 - Solar Thermal Energy Systems Credit Hours: 3

REE 307 - Seminar Credit Hours: 12 [b]
or
REE 407 - Seminar Credit Hours: 12 [b]

REE 425 - Electricity Markets & Modeling Credit Hours: 3
REE 427 - Greenhouse Gas Acct/Footprints Credit Hours: 3
REE 439 - Energy Systems Auditing and Management Credit Hours: 3
REE 451 - Geo Enrgy & direct use app Credit Hours: 3
REE 453 - Power System Analysis Credit Hours: 3
REE 454 - Power Syst Protection & Ctnrl Credit Hours: 3
REE 455 - Energy Efficient Building Dsgn Credit Hours: 3
REE 465 - Renewable Energy Transport Sys Credit Hours: 3
REE 469 - Grid Integration of Renewables Credit Hours: 3

Senior Sequences:
With approval, students can complete a graduate-level REE sequence to meet the senior sequence requirement. Enrollment in graduate-level courses at the undergraduate level requires special approval.

Students are required to complete a minimum of one sequence of technical courses (all three courses) from the list below:

Green Building:
MECH 433 - HVAC Credit Hours: 3
REE 439 - Energy Systems Auditing and Management Credit Hours: 3
REE 455 - Energy Efficient Building Dsgn Credit Hours: 3

Power Systems:
REE 453 - Power System Analysis Credit Hours: 3
REE 454 - Power Syst Protection & Ctnrl Credit Hours: 3
REE 469 - Grid Integration of Renewables Credit Hours: 3

Geothermal:
REE 431 - Geotherm Heat Pump Desgn Credit Hours: 3
REE 451 - Geo Enrgy & direct use app Credit Hours: 3
REE 471 - Geothermal Powr Plnt Desgn Credit Hours: 3

Renewable Energy Engineering, MS

Degree Requirements

The Master of Science in Renewable Energy Engineering is a rigorous curriculum that requires 54 credit hours and approximately two years to complete.

Note: The Portland-Metro campus is a laptop-required campus with resources like laptop specifications, financial aid, and helpful instructions found at http://www.oit.edu/portland-metro/college-costs/bring-your-own-device.

Curriculum

Required courses and recommended terms during which they should be taken:

First Year Fall
REE 511 - Research Methods/Innovation I Credit Hours: 3
REE 515 - Energy Engineering I Credit Hours: 3
REE 5xx REE Specialization Sequence X: Course 1 of 3 Credit Hours: 3
Total: 9 Credit Hours

Winter
REE 512 – Research Methods/Innov II Credit Hours: 3
REE 516 - Energy Engineering II Credit Hours: 3
REE 5xx REE Specialization Sequence X: Course 2 of 3 Credit Hours: 3
Total: 9 Credit Hours

Spring
REE 513 - Research Methods/Innov III Credit Hours: 3
REE 517 - Energy Engineering III Credit Hours: 3
REE 5xx REE Specialization Sequence X: Course 3 of 3 Credit Hours: 3
Total: 9 Credit Hours

Second Year Fall
REE 599 Graduate Research or Project 3
REE 5yy REE Specialization Sequence Y: Course 1 of 3 Credit Hours: 3

REE 5zz REE Specialization Sequence Z: Course 1 of 3 Credit Hours: 3
or
Elective Credit Hours: 3
Total: 9 Credit Hours

Winter
REE 599 Graduate Research or Project 3
REE 5yy REE Specialization Sequence Y: Course 2 of 3 Credit Hours: 3

REE 5zz REE Specialization Sequence Z: Course 2 of 3 Credit Hours: 3
or
Elective Credit Hours: 3
Total: 9 Credit Hours

Spring
REE 599 Graduate Research or Project 3
REE 5yy REE Specialization Sequence Y: Course 3 of 3 Credit Hours: 3

REE 5zz REE Specialization Sequence Z: Course 3 of 3 Credit Hours: 3
or
Elective Credit Hours: 3
Total: 9 Credit Hours

Total for a M.S. in Renewable Energy Engineering: 54 Credit Hours

Renewable Energy Specialization Sequences

Students must complete REE specialization sequences from the list below. One sequence constitutes three courses under the titles below. Other sequences may be used to satisfy this requirement with advisor and department chair approval. Not all sequences are offered every year. Some sequences are campus specific.

Advanced Energy Storage
REE 591 - Hydrogen Prod & Storage Credit Hours: 3
REE 592 - Advanced Batteries Credit Hours: 3
REE 593 - Advanced Fuel Cells Credit Hours: 3

Biofuels and Biomass
REE 521 - Production of Biomass/Biofuels Credit Hours: 3
REE 541 - Utiliztn Strategies/Bioenergy Credit Hours: 3

REE 561 - Process Desgn/Econ Eval f/BES Credit Hours: 3

Electrical Power Systems
REE 529 - Power System Analysis Credit Hours: 3
REE 549 - Power System Protection/Contrl Credit Hours: 3
REE 569 - Grid Integration of Renewables Credit Hours: 3

Electrochemical Systems
REE 523 - Hydrogen Productn and Storage Credit Hours: 3
REE 543 - Matrls f/Electrochemical Proc Credit Hours: 3
REE 563 - Batteries Credit Hours: 3

Energy Efficient Building Systems
REE 533 - Heating, Ventilation/Air Condi Credit Hours: 3
REE 553 - Energy Systems Mgmt/Auditing Credit Hours: 3
REE 573 - Energy-Efficient Bldg Design Credit Hours: 3

Energy Storage
REE 581 - Energy Storage Fundamentals Credit Hours: 3
REE 582 - Introduction to Batteries Credit Hours: 3
REE 583 - Intro to Fuel Cells Credit Hours: 3

Fuel Cell Systems
REE 535 - Fuel Cell Fundamentals Credit Hours: 3
REE 555 - Stationary Fuel Cells Credit Hours: 3
REE 575 - Transporation Fuel Cells Credit Hours: 3

Geothermal Energy
REE 531 - Ground-Source Heat Pumps Credit Hours: 3
REE 551 - Advanced Geothermal Energy Credit Hours: 3
REE 571 - Geothermal Power Generation Credit Hours: 3

Global Energy Issues
REE 537 - Sustainability/Energy Systems Credit Hours: 3
REE 557 - Costing Renewable Energy Credit Hours: 3
REE 577 - Renewable Energy Integration Credit Hours: 3

Hydro Power Systems and Integration
REE 539 - Hydraulics/Fluid Mech/Hydropow Credit Hours: 3
REE 559 - Develop of Hydropower Proj Credit Hours: 3
REE 579 - Econ/Reg/Envir Aspects Hydrop Credit Hours: 3

Photovoltaic Systems and Processes
REE 525 - Solid-State Physics/Photov Mat Credit Hours: 3
REE 545 - Applied Photovoltaics Credit Hours: 3
REE 565 - Semiconductor Process Enginrng Credit Hours: 3

Wind Power Systems and Integration
REE 527 - Wind Power Generators Credit Hours: 3
REE 547 - Electric Power Conversion Credit Hours: 3
REE 567 - Wind Energy Systems Integratn Credit Hours: 3

Optical Engineering, BS Dual Major

Degree Requirements

A dual major in Optical Engineering requires 40 specialized credits in optics and electrical engineering. Some of these courses may be used to meet requirements in the primary major also. The capstone project required in the student's primary major is expected to incorporate elements from both the primary and optical engineering majors. Since the required courses for Optical Engineering must be taken along with those for the primary major, a full curriculum map is not provided. Students should carefully plan each term in consultation with their primary major advisor and with their Optical Engineering advisor. To obtain a dual major in optical engineering, students must complete the courses required for the Bachelor of Science degree in their primary engineering major as well as the following list of specialized Optical Engineering courses:

EE 221 - Circuits I Credit Hours: 4
EE 223 - Circuits II Credit Hours: 4
EE 225 - Circuits III Credit Hours: 4
EE 343 - Solid State Electronic Devices Credit Hours: 3

EE 448 - Geometric Optics Credit Hours: 4
or
PHY 448 - Geometric Optics Credit Hours: 4

EE 449 - Radiometry & Optical Detect Credit Hours: 4
or
PHY 449 - Radiometry & Optical Detect Credit Hours: 4

EE 450 - Physical Optics Credit Hours: 4
or
PHY 450 - Physical Optics Credit Hours: 4

EE 451 - Lasers Credit Hours: 4
or
PHY 451 - Lasers Credit Hours: 4

EE 452 - Waveguides and Fiber Optics Credit Hours: 4
or
PHY 452 - Waveguides and Fiber Optics Credit Hours: 4

EE 453 - Optical Metrology Credit Hours: 4
or
PHY 453 - Optical Metrology Credit Hours: 4

Robotics, Autonomous Systems, and Control Engineering, BS Dual Major

Degree Requirements

A dual major in Robotics, Autonomous Systems, and Control Engineering requires 92 credits in automation and other engineering coursework. Many of these course credits may be used to meet requirements in the primary major; depending upon selection of primary major it is estimated that only 28-36 additional credits will be needed beyond the primary major requirements. The capstone project required in the student's primary major is expected to incorporate elements from both the primary and the Robotics, Autonomous Systems, and Control Engineering majors. Since the required courses for Robotics, Autonomous Systems, and Control Engineering must be taken along with those for the primary major, a full curriculum map is not provided. Students should carefully plan each term in consultation with their primary major advisor and with their Robotics, Autonomous Systems, and Control Engineering advisor. To obtain a dual major in Robotics, Autonomous Systems, and Control Engineering, students must complete the courses required for the Bachelor of Science degree in their primary engineering major as well as the following list of specialized Robotics, Autonomous Systems, and Control Engineering courses:

Electrical Engineering and Computer Science Requirements

CST 116 - C++ Programming I Credit Hours: 4
EE 131 - Digital Electronics I Credit Hours: 4
EE 133 - Digital Electronics II Credit Hours: 4
EE 221 - Circuits I Credit Hours: 4
EE 223 - Circuits II Credit Hours: 4
EE 225 - Circuits III Credit Hours: 4
EE 333 - Intro to Microcontrollers Credit Hours: 4
EE 430 - Linear Sys & Digital Signal Credit Hours: 5
ENGR 267 - Engineering Programming Credit Hours: 3
Total: 36 Credit Hours

Robotics, Autonomous Systems, and Control Engineering Major Core

EE 461 - Control Engineering I: Classical Methods Credit Hours: 4
ENGR 461 - Modeling and Simulation of Dynamic Systems Credit Hours: 4
ENGR 462 - Control Engineering II: Modern Methods Credit Hours: 4
ENGR 463 - Motion Control in Mechanisms and Robotics Credit Hours: 4
ENGR 464 - Autonomous Systems Credit Hours: 4
REE 463 - Energy Systems Instrumentation Credit Hours: 3
Total: 23 Credit Hours

Supporting Engineering Requirements
ENGR 211 - Engineering Mechanics: Statics Credit Hours: 4
ENGR 212 - Engineering Mech: Dynamics Credit Hours: 3
ENGR 355 - Thermodynamics Credit Hours: 3
MECH 318 - Fluid Mechanics Credit Hours: 4
MECH 323 - Heat Transfer I Credit Hours: 3
REE 243 - Electrical Power Credit Hours: 4
REE 253 - Electromech Energy Conversion Credit Hours: 3
SEM 421 - Systems Engineering Credit Hours: 4
SEM 422 - Advanced Systems Engineering Credit Hours: 4
Total: 32 Credit Hours

Systems Engineering and Technical Management, BS Dual Major

Degree Requirements
To obtain a dual major in Systems Engineering & Technical Management, students must complete the courses required for the Bachelor of Science degree in their primary engineering major, as well as the dual major requirements listed below. Some of these courses may be used to meet requirements in the primary major also.

SE Major Core Requirements
SEM 421 - Systems Engineering Credit Hours: 4
SEM 422 - Advanced Systems Engineering Credit Hours: 4
SEM 425 - Advanced Engineering Mgmt Credit Hours: 4
Total: 12 Credit Hours

Mathematics Requirements
MATH 321 - Appl Diff Equation I Credit Hours: 4
MATH 341 - Linear Algebra I Credit Hours: 4

MATH 465 - Mathematical Statistics Credit Hours: 4
or
MATH 362 - Statistical Methods II Credit Hours: 4
Total: 12 Credit Hours

Systems Electives
[Select 9 credit hours from the following electives or advisor approved Elective courses]
EE 430 - Linear Sys & Digital Signal Credit Hours: 5
EE 432 - Advanced Digital System Design Credit Hours: 4
EE 401 - Communication Systems Credit Hours: 5
ST 236 - Engineering for Quality Software Credit Hours: 4
CST 316 - JR Team-Based Proj Dev I Credit Hours: 4
CST 324 - Database Systems and Design Credit Hours: 4
MFG 447 - Lean Manufacturing Credit Hours: 3
MIS 311 - Intro to Systems Analysis Credit Hours: 3
MIS 341 - Relational Database Design I Credit Hours: 4
MIS 375 - Decision Support Systems Credit Hours: 3
Total: 9 Credit Hours

Management Electives
[Select 9 credit hours from the following electives or advisor approved elective courses]
ACC 203 - Prin of Managerial Acct Credit Hours: 4
BUS 223 - Marketing I Credit Hours: 3
BUS 226 - Business Law Credit Hours: 3
BUS 304 - Engineering Management Credit Hours: 3
BUS 308 - Prin of International Business Credit Hours: 3
MGT 321 - Operations Management I Credit Hours: 3
MGT 345 - Engineering Economy Credit Hours: 3
MGT 461 - Lean/Six Sigma Management I Credit Hours: 3
MGT 462 - Lean/Six Sigma Management II Credit Hours: 3
MGT 463 - Lean/Six Sigma Management III Credit Hours: 3
Total: 9 Credit Hours

Total for a B.S. (Dual) in Systems Engineering and Technical Management: 42 Credit Hours

Note: Many courses may be part of the primary major.

Geomatics Department

Jack Walker, *Department Chair*
Professors: M. Marker, J. Ritter, J. Walker

Degree Offered

- Bachelor of Science in Geomatics with options in:
  - Surveying
  - Geographic Information Systems

Minors Offered

- Geographic Information Systems
- Surveying

Geomatics is the modern surveying, engineering, geoscience, and IT-related discipline which employs an integrated approach to the measurement, mathematical modeling, and management of spatial data. Spatial data is obtained from a variety of sources including ground-based instruments, mobile mapping technologies, drones, hydrographic, and earth-orbiting satellite systems. Spatial data is used to create a detailed but understandable picture of the Earth's physical features. This data enables the design and development of land administration systems for sustainable planning and management of the built environment.

Geomatics provides the opportunity to work primarily outdoors, exclusively in an office, or in some combination of the two. Geomatics attracts individuals who enjoy mathematics, history, making maps, using advanced software and high-tech instruments. Career employment is available in rural and urban areas throughout the nation.

The United Nations has adopted its first resolution, *A Global Geodetic Reference Frame for Sustainable Development*, recognizing the importance of a globally coordinated approach to geodesy – the geomatics discipline focused on accurately measuring the shape, rotation, and gravitational field of the earth.

Students within the Geomatics Program must choose between either an option in Surveying or Geographic Information Systems (GIS). Students may, with consent of their advisor, complete both options.

Program Objectives

Graduates of the Oregon Tech Geomatics options will:

1. Acquire the ability to obtain professional licensure and/or certifications in the geospatial industry.
2. Advance in the geospatial industry during their career by becoming involved in local, state, national, or international professional organizations.
3. Obtain industry positions requiring increased responsibility.
4. Assume responsibility for lifelong learning in professional and personal development.
5. Demonstrate readiness for graduate education and/or advanced technical education.

Student Preparation

It is recommended that students prepare for entrance into the program by emphasizing mathematics and science in high school. Two years of algebra and one year each of geometry, trigonometry and physics are desirable prerequisites.

Bachelor of Science in Geomatics, Surveying Option

The department offers a nationally-recognized professional degree program that prepares students for employment within the geomatics profession and licensure as a Professional Land Surveyor (PLS). Students enjoy small classes taught by licensed professionals that emphasize fundamental theory and problem solving in a computer-intensive curriculum. Field laboratory experiences integrated throughout the curriculum provide practical skills, and offer extensive opportunities to prepare students to work in teams using state-of-the art technology. Upon completing the freshman year, students often have enough experience to obtain summer employment as a survey crew member.

Completion of the program qualifies graduates to take the Fundamentals of Surveying (FS) exam during the spring term of the senior year. The broad-based nature of the curriculum ensures that graduates will be prepared to fulfill both the traditional and contemporary roles of the profession.

Cooperative Education

Geomatics students may, upon completion of the freshman year, apply for student career experience programs (Pathways) with the U.S. Bureau of Land Management, Bonneville Power Administration, U.S. Forest Service, or other appropriate federal employers. Work experiences are paid and may be for three or six month periods. Students may earn two or four credits for work experience periods. A maximum of four credits may be applied toward the bachelor's degree.

Geomatics students are also eligible for the Civil Engineering Cooperative Program (CECOP), offering high-quality, paid industrial experience and related academic activities while students pursue their degree. The Oregon State Board of Examiners for Engineering and Land Surveying (OSBEELS) counts this internship time toward PLS licensure requirements.

Scholarships

Approximately 40 scholarships are available to geomatics students each year through an endowed Geomatics Department Scholarship, CLSA, PLSO, LSAW, WESTFED, NSPS, and other organizations.

Career Opportunities

The employment forecast for graduates in this field is exceptional. As an increasing number of licensed surveyors across the nation retire, a personnel shortage has been created within the geomatics profession. Graduates are prepared for a wide variety of career opportunities in the fields of surveying, engineering, construction, remote sensing, GIS, and land information management.

Accreditation

The Geomatics Program (surveying option) is accredited by the Applied and Natural Science Accreditation Commission (ANSAC) of ABET, Inc., http://www.abet.org. ABET is a specialized accrediting board recognized by the Council for Higher Education and/or the Secretary of the U.S. Department of Education.

Bachelor of Science in Geomatics, Geographic Information Systems (GIS) Option

Geographic Information Systems (GIS) is a systematic approach to the management, analysis, and display of geographic information. Management of such information requires application of advanced RDBMS techniques, the ability to see a project through to completion requires fundamental project management skills as well. The analysis of geodata sets is predicated on a firm understanding of spatial reference/coordinate systems, topological relationships, and statistical methods. Techniques for displaying geographic information take various forms such as maps, geographic datasets, and data models. Students graduating from this course of study will understand how to manipulate geographically based data in order to solve geospatial problems and how to use and create online resources to effectively communicate their results.

Students learn in a project-based environment to manage the flow of data through the project in terms of data acquisition, processing, analysis, and presentation. Within the GIS option, students are able to select individual areas of focus based on independent study and/or online courses.

Career Opportunities

The list of opportunities for students in the field of GIS is continuing to show substantial growth. As our society becomes more data centered, the importance of understanding the spatial location of this data and its spatial relationship to other data is becoming increasingly apparent. Understanding such geospatial relationships is fundamental to areas such as health care, land records management, transportation modeling, environmental engineering/science, and urban planning, to name only a few. Local, state, and federal agencies are embracing GIS more each year as these agencies realize that GIS is the appropriate tool to solve long-standing geospatial problems. Private industry is also embracing GIS since it can be used to streamline delivery and/or response routes. Both private and public entities have also realized that GIS provides an excellent decision support framework structure.

Geomatics, Geographic Information Systems (GIS) Option, BS

Degree Requirements

A minimum of 180 term hours must be completed for the Surveying option, of which 80 term hours must be in the GIS and geomatics area. A minimum of 181 term hours must be completed for the GIS option, of which 74 term hours must be in the GIS and geomatics area.

Curriculum

Required courses and recommended terms during which they should be taken:

Freshman Year Fall
GIS 103 - The Digital Earth Credit Hours: 3
GME 161 - Plane Surveying I Credit Hours: 4
MATH 111 - College Algebra Credit Hours: 4
WRI 121 - English Composition Credit Hours: 3
Total: 14 Credit Hours

Winter
CE 203 - Engineering Graphics Credit Hours: 3
GIS 134 - Geographic Info Systems Credit Hours: 3
GME 175 - Computations and Platting Credit Hours: 3
ATH 112 - Trigonometry Credit Hours: 4
Social Science Elective Credit Hours: 3
Total: 16 Credit Hours

Spring
GIS 205 - Mobile and Web GIS Credit Hours: 2
GME 162 - Plane Surveying II Credit Hours: 4
MATH 251 - Differential Calculus Credit Hours: 4
MIS 275 - Intro to Relational Databases Credit Hours: 4
WRI 122 - Argumentative Writing Credit Hours: 3
Total: 17 Credit Hours

Sophomore Year Fall
GIS 306 - Geospatial Raster Analysis Credit Hours: 4
GME 241 - Boundary Law I Credit Hours: 3
MATH 252 - Integral Calculus Credit Hours: 4
MIS 118 - Intro to Programming in C# Credit Hours: 4
Total: 15 Credit Hours

Winter
GIS 316 - Geospatial Vector Analysis I Credit Hours: 4
GME 242 - Land Descrip & Cadastre Credit Hours: 2
MATH 254 - Vector Calculus I Credit Hours: 4
MIS 218 - Intermediate Programming in C# Credit Hours: 4
Total: 14 Credit Hours

Spring
BUS 226 - Business Law Credit Hours: 3
MATH 361 - Statistical Methods I Credit Hours: 4
MGT 345 - Engineering Economy Credit Hours: 3
SPE 111 - Public Speaking Credit Hours: 3
Social Science Elective Credit Hours: 3
Total: 16 Credit Hours

Junior Year Fall
GIS 332 - Customizing the GIS Environ I Credit Hours: 4
SPE 321 - Small Group/Team Comm Credit Hours: 3
PHY 221 - General Physics w/Calculus Credit Hours: 4
WRI 227 - Technical Report Writing Credit Hours: 3
Social Science Elective Credit Hours: 3
Total: 17 Credit Hours

Winter
GIS 432 - Customizing the GIS Envirn II Credit Hours: 4
Math Elective Credit Hours: 3 [a]
MIS 341 - Relational Database Design I Credit Hours: 4
PHY 222 - General Physics w/Calculus Credit Hours: 4
Total: 15 Credit Hours

Spring
GIS 426 - Geospatial Vector Analysis II Credit Hours: 4
MIS 442 - Adv Database App Programming Credit Hours: 4
Humanities Elective Credit Hours: 3
Social Science Elective Credit Hours: 3
Total: 14 Credit Hours

Senior Year Fall
BUS 304 - Engineering Management Credit Hours: 3
GIS 446 - GIS Database Development Credit Hours: 2
GME 425 - Remote Sensing Credit Hours: 4
GME 451 - Geodesy Credit Hours: 4
Total: 13 Credit Hours

Winter
GME 452 - Map Projections Credit Hours: 3
GME 455 - GNSS Surveying for GIS Credit Hours: 4
Humanities Elective Credit Hours: 3
Science Elective Credit Hours: 4
Total: 14 Credit Hours

Spring
GME 468 - Geomatics Practicum Credit Hours: 2
WRI 327 - Advanced Tech Writing Credit Hours: 3
Business Elective Credit Hours: 3 (upper-division) [b]
Humanities Elective Credit Hours: 3
Science Elective Credit Hours: 4
Total: 15 Credit Hours

Total for a B.S. in Geomatics, Geographic Information Systems Option: 180 Credit Hours

Note: Humanities and Social Science Electives must be approved by the department.

[a] Students must demonstrate advancement in educational content, courses must not be lower level than courses in the required curriculum. MATH 341 or MATH 362 recommended
[b] BUS 356 recommended

Geomatics, Surveying Option, BS

Degree Requirements

A minimum of 180 term hours must be completed for the Surveying option, of which 80 term hours must be in the GIS and geomatics area. A minimum of 180 term hours must be completed for the GIS option, of which 74 term hours must be in the GIS and geomatics area.

Curriculum

Required courses and recommended terms during which they should be taken:

Freshman Year Fall
GIS 103 - The Digital Earth Credit Hours: 3
GME 161 - Plane Surveying I Credit Hours: 4
MATH 112 - Trigonometry Credit Hours: 4
WRI 121 - English Composition Credit Hours: 3
Total: 14 Credit Hours

Winter
CE 203 - Engineering Graphics Credit Hours: 3
GIS 134 - Geographic Info Systems Credit Hours: 3
GME 175 - Computations and Platting Credit Hours: 3
MATH 251 - Differential Calculus Credit Hours: 4
WRI 122 - Argumentative Writing Credit Hours: 3
Total: 16 Credit Hours

Spring
GIS 205 - Mobile and Web GIS Credit Hours: 2
GME 162 - Plane Surveying II Credit Hours: 4
MATH 252 - Integral Calculus Credit Hours: 4
SPE 111 - Public Speaking Credit Hours: 3
Social Science Elective Credit Hours: 3
Total: 16 Credit Hours

Sophomore Year Fall
GME 163 - Route Surveying Credit Hours: 4
GME 241 - Boundary Law I Credit Hours: 3
MATH 254 - Vector Calculus I Credit Hours: 4
PHY 221 - General Physics w/Calculus Credit Hours: 4
Total: 15 Credit Hours

Winter
GME 242 - Land Descrip & Cadastre Credit Hours: 2
GME 264 - Digital Design for Surveying Credit Hours: 2
PHY 222 - General Physics w/Calculus Credit Hours: 4
WRI 227 - Technical Report Writing Credit Hours: 3
Social Science Elective Credit Hours: 3
Total: 14 Credit Hours

Spring
GME 372 - Subdiv'n Planning and Platting Credit Hours: 3
MATH 361 - Statistical Methods I Credit Hours: 4
PHY 223 - General Physics w/Calculus Credit Hours: 4
Humanities Elective Credit Hours: 3
Total: 14 Credit Hours

Junior Year Fall
GIS 306 - Geospatial Raster Analysis Credit Hours: 4
GME 343 - Boundary Surveys Credit Hours: 4
MIS 113 - Intro to Database Systems Credit Hours: 3
WRI 327 - Advanced Technical Writing Credit Hours: 3
Social Science Elective Credit Hours: 3
Total: 17 Credit Hours

Winter
GIS 316 - Geospatial Vector Analysis I Credit Hours: 4
GME 466 - Boundary Law II Credit Hours: 3
SPE 321 Small Group/Team Comm Credit Hours: 3
ENV/GIS/GME Elective Credit Hours: 4
Math Elective Credit Hours: 3 [a]
Total: 17 Credit Hours

Spring
BUS 226 - Business Law Credit Hours: 3
GME 351 - ConstrEngr Surveying Credit Hours: 3
GME 444 - Adjustment by Least Squares Credit Hours: 4
MGT 345 - Engineering Economy Credit Hours: 3
Humanities Elective Credit Hours: 3
Total: 15 Credit Hours

Senior Year Fall
BUS 304 - Engineering Management Credit Hours: 3
GME 425 - Remote Sensing Credit Hours: 4
GME 451 - Geodesy Credit Hours: 4
MIS 118 - Intro to Programming in C# Credit Hours: 4
Total: 15 Credit Hours

Winter
GME 452 - Map Projections Credit Hours: 3
GME 454 - GNSS Surveying Credit Hours: 4
Science Elective Credit Hours: 4
Social Science Elective Credit Hours: 3
Total: 14 Credit Hours

Spring
GME 468 - Geomatics Practicum Credit Hours: 2
Business Elective Credit Hours: 3
Humanities Elective Credit Hours: 3
Science Elective Credit Hours: 4 [b]
Total: 12 Credit Hours

Total for a B.S. in Geomatics, Surveying Option: 180 Credit Hours

Note: Humanities and Social Science Electives must be approved by the department.

[a] Students must demonstrate advancement in educational content, courses must not be lower level than courses in the required curriculum. MATH 341 or MATH 362 recommended
[b] GEOL 201 recommended

Geographic Information Systems Minor

The Geographic Information Systems (GIS) minor is open to all majors and is especially recommended for students majoring in Geomatics (Surveying Option), Environmental Sciences, Business/Management/ Information Systems, Computer Software Engineering, Renewable Energy Engineering and Health Care. The minor provides the essential kernel of knowledge and skill necessary to approach geospatial issues pertaining to these disciplines. An advisor in the Geomatics Department must approve any substitution of courses from those listed. Preparation for this course of study entails a functional level of computer literacy that can be evaluated in consultation with an advisor. Students must also have successfully completed MATH 111 prior to enrolling in upper-division classes.

The Minor in Geographic Information Systems (GIS) acknowledges the achievement of 22 credits taken from the following GIS course listing.

Requirements of Minor

GIS 103 - The Digital Earth Credit Hours: 3
GIS 134 - Geographic Info Systems Credit Hours: 3

Elective Courses: 16 Credits Required

GIS 306 - Geospatial Raster Analysis Credit Hours: 4
GIS 316 - Geospatial Vector Analysis I Credit Hours: 4
GIS 332 - Customizing the GIS Environ I Credit Hours: 4
GIS 407 - Seminar Credit Hours: 4
GIS 426 - Geospatial Vector Analysis II Credit Hours: 4
GIS 432 - Customizing the GIS Envirn II Credit Hours: 4
GIS 446 - GIS Database Development Credit Hours: 4

Surveying Minor

The Surveying minor is open to all engineering majors, and is especially recommended for students majoring in Civil Engineering and Geomatics (GIS option). The minor provides the essential knowledge and skills which meet OSBEELS requirements (OAR 820-010-0226) allowing engineering students to sit for the Fundamentals of Surveying (FS) examination, and pursue licensure as a Professional Surveyor (PS). An advisor in the Geomatics Department must approve substitution of courses from those listed.

The Minor in Surveying acknowledges the achievement of 27 credits taken from the following geomatics course listing.

Requirements of Minor

GIS 134 - Geographic Info Systems Credit Hours: 3 [c]
GME 162 - Plane Surveying II Credit Hours: 4 [c,d]
GME 241 - Boundary Law I Credit Hours: 3 [c]
GME 242 - Land Descrip & Cadastre Credit Hours: 2 [c]
GME 264 - Digital Design for Surveying Credit Hours: 2 [a]
GME 343 - Boundary Surveys Credit Hours: 4

Elective Courses: 8 Credits Required

GME 163 - Route Surveying Credit Hours: 4
GME 351 - Constr/Engr Surveying Credit Hours: 3 [b]
GME 372 - Subdiv'n Planning and Platting Credit Hours: 3
GME 425 - Remote Sensing Credit Hours: 4 [c]
GME 444 - Adjustment by Least Squares Credit Hours: 4
GME 451 - Geodesy Credit Hours: 4 [c]
GME 452 - Map Projections Credit Hours: 3 [c]
GME 455 - GNSS Surveying for GIS Credit Hours: 4 [c]
GME 466 - Boundary Law II Credit Hours: 3

Notes:

[a] CIV 415 will substitute for GME 264
[b] CE 351 will substitute for the GME 163 prerequisite
[c] Required course for GIS majors
[d] MATH 221 will substitute for the GME 175 prerequisite

Management Department

Hallie Neupert, *Department Chair, Program Director, Health Care Management*
Richard Bailey, *Curriculum Coordinator, Accounting*
Sharon Beaudry, *Program Director and Curriculum Coordinator, Business*
Tracey Coon, *Program Director and Curriculum Coordinator, Cybersecurity*
Jeff Dickson, *Program Director and Curriculum Coordinator, Health Informatics and Information Technology*
Carmen Morgan, *Program Director, Accounting*
Pat Schaeffer, *Program Director and Curriculum Coordinator, Operations Management*
Maureen Sevigny, *Program Director, Management Distance Education, Program Director and Curriculum Coordinator, BAS Technology and Management*
Kristy Weidman, *Program Director and Curriculum Coordinator, Marketing*
Professors: R. Bailey, S. Bailey, H. Neupert, M. Sevigny
Associate Professors: S. Beaudry, J. Dickson, G. Kirby, C. Morgan, M. Pierce, P. Schaeffer, K. Weidman
Assistant Professors: D. Carrere, T. Coon, D. DaSaro, J. Emard, G. Lomprey, L. Stewart, L. Yates

Degrees Offered

- Bachelor of Science in Accounting
- Bachelor of Science in Business, with options in:
  - Management
  - Marketing
- Bachelor of Science in Cybersecurity
- Bachelor of Science in Health Care Management, with options in:
  - Administration
  - Clinical
  - Radiologic Science Management
- Bachelor of Science in Health Informatics
- Bachelor of Science in Information Technology
- Bachelor of Science in Operations Management
- Bachelor of Applied Science in Technology and Management

Minors Offered

- Business
- Health Informatics
- International Business
- Innovation & Entrepreneurship
- Information Technology

Specializations Offered

- Accounting
- Management
- Marketing
- Travel and Tourism

Certificate Offered

- Accounting (post baccalaureate)

Emphases Offered

- Six Sigma Green Belt Certification
- Renewable Energy Management

The Management Department's tech-infused degrees empower graduates through innovative, hands-on, and multi-disciplinary learning experiences, and prepares students to take their place as leaders and managers in contemporary public and private organizations. Faculty members have been selected for their managerial experience and expertise in a diverse array of production and service industries.

Coursework in the Management programs builds upon a fundamental core of courses including management, marketing, accounting, finance, information technology, economics, ethics, globalization, business law, and business presentations. These courses, along with program-specific courses, prepare students for their senior year which includes a senior experience and a capstone course. The senior experience provides management students with an opportunity to integrate and synthesize their educational experience within the context of a "real-world" business problem or project.

As a result of this unique combination of resources and coursework, the Management Degree Programs remain vital and up-to-date, providing students with both the technical tools of management and the interpersonal skills that employers most desire. Equally important, each graduate will be poised to positively contribute to society as well as to today's culturally diverse, global work place.

Department Outcomes

Upon graduating, Management Department graduates should be able to:

1. Communicate the major concepts in the functional areas of accounting, marketing, finance, information technology, and management.

2. Describe the legal, social, ethical, and, economic environments of business in a global context.
3. Solve organization problems, individually and/or in teams, using quantitative, qualitative and technology-enhanced approaches.
4. Demonstrate professional communication and behavior.
5. Apply knowledge of business concepts and functions in an integrated manner.

Degree Completion and Co-enrollment at Community Colleges

The Management Department, in partnership with many Oregon community colleges, offers joint enrollment, transfer credit (articulation) agreements and course sequences so that students may complete a degree with coursework taken from multiple institutions. See the Oregon Tech Registrar Office's website, or a management advisor for additional information.

Oregon Tech Online

Many of the management degrees and core management courses are available online to facilitate the needs of degree completion students. Online courses are particularly appropriate for students capable of self-directed educational activities. Online degrees and courses are offered utilizing Internet delivery and collaborative learning. Degrees available online are: BS in Business, Management Option, BS in Health Care Management, Administration Option, Clinical Option, and Radiologic Sciences Management Option; BS in Operations Management; BS in Health Informatics; BS in Information Technology; BAS in Technology and Management.

Required Student Equipment

Successful completion of these degrees requires intensive, hands-on use of computers.

Therefore, all students are required to own their own computer. Financial aid may be available to help defray the cost of this equipment. Please consult the Financial Aid Office at Oregon Tech.

Note: The Portland-Metro campus is a laptop-required campus. Laptop specifications, financial aid, and helpful instructions may be found at http://www.oit.edu/portland-metro/college-costs/bring-your-own-device.

Accreditation

Oregon Tech has received specialized accreditation for its business programs through the International Accreditation Council for Business Education (IACBE).

Accounting

Degree Offered

- Bachelor of Science in Accounting

Objectives

The BS in Accounting is designed to prepare students for careers in public or private accounting. Students become familiar with computerized accounting applications and skilled in the principles of tax, financial, and cost accounting. Upon graduation students should have sufficient knowledge to sit for the Certified Public Accountant (CPA) and the Certified Management Accountant (CMA) exams.

The BS in Accounting is offered in Klamath Falls.

Career Opportunities

Many students take the CPA and CMA exams upon graduating, go on to graduate school, and/or find employment in this continuously growing, stable and in-demand career field. Job titles include certified public accounting, financial analyst, accountant, tax preparer.

Student Preparation and Admissions

Students must meet Oregon Tech general admissions requirements. Transfer students must arrange for official transcripts from each college and university attended to be sent to Oregon Tech.

Business

Degree Offered

- Bachelor of Science in Business, with options in:
  - Management
  - Marketing

Objectives

The BS in Business prepares leaders to manage organizations in the high technology environments of the 21st century. Students develop their abilities to contribute to an organization's performance through hands-on experience built on a solid theoretical base. The Business curriculum skillfully integrates technology-enhanced coursework with a solid core of business courses. Students will also be prepared for graduate level education, such as the Master's in Business Administration (MBA) degree.

The BS in Business – Management is offered in Klamath Falls and through Oregon Tech Online. The BS in Business – Marketing is offered in Klamath Falls.

Career Opportunities

The BS in Business develops graduates with relevant skills preparing students for entry into careers in business, government, public, or social service organizations.

Job titles include business unit manager, supervisor, marketing specialist, sales manager, marketing researcher, business analyst, and human resource manager.

Student Preparation and Admissions
Students must meet Oregon Tech general admissions requirements. Transfer students must arrange for official transcripts from each college and university attended to be sent to Oregon Tech.

Cybersecurity
Degree Offered
- Bachelor of Science in Cybersecurity

Objectives
The BS in Cybersecurity provides students with the knowledge and skills necessary to competently scan, assess, report, and mitigate cybersecurity threats, vulnerabilities, and exploits on information systems and technology. A graduate of the BS in Cybersecurity program is prepared to assess the security needs of computer and network systems, recommend safeguard solutions, and manage the implementation and maintenance of security devices, systems, and procedures. Includes instruction in computer architecture, scripting, systems analysis, networking, cryptography, security system design, applicable law and regulations, risk assessment and policy analysis, contingency planning, user access issues, investigation techniques, and troubleshooting.

The BS in Cybersecurity is offered in Klamath Falls and Portland-Metro.

Career Opportunities
The BS in Cybersecurity develops graduates with relevant skills preparing students for entry into careers in business, government, public, or social service organizations.

Job titles include IT Security Specialist, Information Security Analyst and Intelligence Analyst.

Student Preparation and Admissions
Students must meet Oregon Tech general admissions requirements. Transfer students must arrange for official transcripts from each college and university attended to be sent to Oregon Tech.

Note: The Portland-Metro campus is a laptop-required campus. Laptop specifications, financial aid, and helpful instructions may be found at http://www.oit.edu/portland-metro/college-costs/bring-your-own-device.

Health Care Management
Degree Offered
- Bachelor of Science in Health Care Management with options in:
  - Administration
  - Clinical
  - Radiologic Sciences Management

Objectives
The BS in Health Care Management prepares graduates for a variety of career options in the rapidly growing health care industry, where health service managers are in high demand. Students will learn the knowledge and skills necessary to become effective managers of health systems and operations and will be prepared to assume managerial positions in hospitals, medical clinics, and medical practices. Health care managers plan, direct, and coordinate medical and health services; and might manage an entire facility, a specific clinical area or department, or a medical practice for a group of providers. Oregon Tech's Health Care Management degree includes three options to meet the student's specific needs and interests.

The BS in Health Care Management is offered in Klamath Falls and through Oregon Tech Online.

Student Preparation and Admissions
Students must meet the standard Oregon Tech admission requirements. Transfer students must arrange for official transcripts from each college and university attended to be sent to Oregon Tech.

For the Health Care Management, Clinical Option
Students must provide documentation of a current state and/or national registry, license, or certificate in an approved allied health field. Each prospective student's academic credits and registry, license, or certificate will be individually evaluated to determine transferability and acceptability of the coursework.

For the Health Care Management, Radiologic Science Management Option
Students must be registered through the ARRT and be in good standing.

Health Informatics
Degree Offered
- Bachelor of Science in Health Informatics

Objectives

Health Informatics is a rapidly developing scientific field that utilizes computer technology to improve the quality and safety of patient care. This program incorporates the sub disciplines of clinical and computational informatics; emphasizing the integration of computer science and the impact of clinical outcomes. Internship opportunities are available during the senior year. Students will complete a capstone course and a senior project.
The BS in Health Informatics is offered in Klamath Falls, Portland-Metro, and through Oregon Tech Online.

Career Opportunities

Health Informatics professionals work as quality managers, business intelligence and epic analyst/developers, data analyst, data scientists, and in health care information technology positions. These professionals are called upon to design and use emerging information technologies with the goal of helping providers and patients access and utilize information to provide improved health care.

Health Informatics professionals provide support in clinical decision making, data architecture, application interfacing, clinical analytics, data analysis, systems analysis and project management.

Student Preparation and Admissions

Students must meet Oregon Tech general admissions requirements. Transfer students must arrange for official transcripts from each college and university attended to be sent to Oregon Tech.

Note: The Portland-Metro campus is a laptop-required campus. Laptop specifications, financial aid, and helpful instructions may be found at http://www.oit.edu/portland-metro/college-costs/bring-your-own-device.

Information Technology

Degree Offered

- Bachelor of Science in Information Technology

Objectives

Information Technology powers modern business. This field is interdisciplinary, with applications to all aspects of the economy. Students solve real-world business problems and gain critical skills and hands-on experience in networking, server administration, programming, databases, information security, and systems analysis. Graduating students are prepared to bridge the technology and management disciplines in their organizations. Internship opportunities are available during the senior year. Students will complete a capstone course and a senior project.

The BS in Information Technology is offered in Klamath Falls, Portland-Metro, and through Oregon Tech Online.

Career Opportunities

The BS in Information Technology prepares students for a wide range of professions including accounting information systems, database administration, systems analyst, business systems consultant, network analyst, software applications specialist, PC support technician, technical writer, Web administrator and vendor representative for either hardware- or software-based firms. Equipped with both technical skills and business understanding, Information Technology graduates are uniquely prepared for faster advancement than many of their contemporaries.

Student Preparation and Admissions

Students must meet Oregon Tech general admissions requirements. Transfer students must arrange for official transcripts from each college and university attended to be sent to Oregon Tech.

Note: The Portland-Metro campus is a laptop-required campus. Laptop specifications, financial aid, and helpful instructions may be found at http://www.oit.edu/portland-metro/college-costs/bring-your-own-device.

Operations Management

Degree Offered

- Bachelor of Science in Operations Management

Objectives

Operations Managers coordinate equipment, materials, human capital and information across businesses to profitably meet or exceed customer expectations. Students in Operations Management successfully blend the art of management with applied science through creativity, people skills, rational analysis and application of technology.

Operations Management students develop mastery of concepts, tools, and skills in management sciences and specialties tailored to the industries of interest to the student. Particular emphasis is directed toward development of skills in problem solving, project management, communication, and managing effectively in team-based work environments. Students are also prepared for graduate level education, such as the MBA (Master's in Business Administration) degree. Internship opportunities are available during the senior year. Students will complete a capstone course and a senior project.

The BS in Operations Management is offered in Klamath Falls, Portland-Metro, and through Oregon Tech online.

Career Opportunities

The BS in Operations Management prepares students for leadership positions within a wide variety of product and service industries. Initial job titles include: production planner, inventory control analyst, industrial engineer, production supervisor, and quality control manager. Typical departments in which graduates find themselves working are manufacturing, manufacturing engineering, industrial engineering, production control, finance, and quality assurance.

Upon graduation, students should be prepared to address critical issues related to productivity management in a global competitive economy and play leadership roles in the design and implementation of quality control and management programs. They will have mastered a wide array of microcomputer technology and software applications, giving them a competitive edge in the job market.

Student Preparation and Admissions

Students must meet Oregon Tech general admissions requirements. Transfer students must arrange for official transcripts from each college and university attended to be sent to Oregon Tech.

Note: The Portland-Metro campus is a laptop-required campus. Laptop specifications, financial aid, and helpful instructions may be found at http://www.oit.edu/portland-metro/college-costs/bring-your-own-device.

Technology and Management

Degree Offered

- Bachelor of Applied Science in Technology and Management

Objectives

The Bachelor of Applied Science (BAS) in Technology and Management provides a path to a bachelor's degree for those students who have completed a technical Associate of Applied Science (AAS) or Associate of Science (AS) degree from an accredited institution recognized by the Council for Higher Education (CHEA) and are seeking career advancement into management or in their technical career fields. The BAS builds on a core of 60 credits of career and technical education (CTE) courses taken as part of the AAS or AS degree, adding 65 credits of business, management, and information technology courses and 55 credits of broad-based general education courses to enable the BAS graduate to advance in the workplace or continue on to graduate school. The management core includes a three-term capstone senior project to enable the student to demonstrate successful integration of technical and managerial coursework.

The BAS in Technology and Management is offered in Klamath Falls, Portland-Metro, and through Oregon Tech online.

Graduation Requirements

The BAS in Technology and Management requires 180 credits including 60 upper-division credits and up to 60 lower-division career and technical education (CTE) credits transferred from an AAS or AS degree. In addition, the BAS includes 55 general education credits including 18 credits in communication, 12 credits of social science, 9 credits in humanities, and 16 credits of math and science including 4 credits of mathematics with a prerequisite of intermediate algebra or higher and 4 credits of laboratory science.

Accounting, BS

The Accounting degree is designed to prepare students for careers in public or private accounting. Students become familiar with computerized accounting applications and skilled in the principles of tax, financial, and cost accounting. Upon graduation students selecting this option should have sufficient knowledge to sit for the Certified Public Accountant (CPA) and the Certified Management Accountant (CMA) exams.

Curriculum

Required courses and recommended terms during which they should be taken:

Freshman Year Fall
MATH 111 - College Algebra Credit Hours: 4
PSY 201 - Psychology Credit Hours: 3
WRI 121 - English Composition Credit Hours: 3
Humanities Elective Credit Hours: 3
Laboratory Science Elective Credit Hours: 4
Total: 17 Credit Hours

Winter
BUS 215 - Principles of Management Credit Hours: 3
ECO 201 - Principles of Microeconomics Credit Hours: 3
MIS 102 - Spreadsheet Software Lab Credit Hours: 1
SPE 111 - Public Speaking Credit Hours: 3
WRI 122 - Argumentative Writing Credit Hours: 3
Elective Credit Hours: 3
Total: 16 Credit Hours

Spring
ECO 202 - Principles of Macroeconomics Credit Hours: 3
MIS 275 - Intro to Relational Databases Credit Hours: 4
SPE 321 - Small Group/Team Comm Credit Hours: 3
Elective Credit Hours: 3
Humanities Elective Credit Hours: 3
Total: 16 Credit Hours

Sophomore Year Fall
ACC 201 - Prin of Accounting I Credit Hours: 4
MATH 361 - Statistical Methods I Credit Hours: 4
WRI 227 - Technical Report Writing Credit Hours: 3
Elective Credit Hours: 3
Total: 14 Credit Hours

Winter
ACC 202 - Prin of Accounting II Credit Hours: 4
BUS 223 - Marketing I Credit Hours: 3
MATH 371 - Finite Math/Calc I Credit Hours: 4

PHIL 331 - Ethics in the Professions Credit Hours: 3
or
PHIL 342 - Business Ethics Credit Hours: 3
Total: 14 Credit Hours

Spring
ACC 203 - Prin of Managerial Acct Credit Hours: 4
ACC 205 - Computerized Accounting Credit Hours: 3
BUS 226 - Business Law Credit Hours: 3
MGT 335 - Project Management Credit Hours: 3
MIS 375 - Decision Support Systems Credit Hours: 3
Total: 16 Credit Hours

Junior Year Fall
ACC 331 - Interm Accounting I Credit Hours: 4
BUS 308 - Prin of International Business Credit Hours: 3
BUS 356 - Business Presentations Credit Hours: 4
MIS 311 - Intro to Systems Analysis Credit Hours: 3
Total: 14 Credit Hours

Winter
ACC 320 - Cost Accounting I Credit Hours: 4
ACC 325 - Finance Credit Hours: 4
ACC 332 - Interm Accounting II Credit Hours: 4
MIS 312 - Systems Analysis I Credit Hours: 4
Total: 16 Credit Hours

Spring
ACC 321 - Cost Accounting II Credit Hours: 4
ACC 333 - Interm Accounting III Credit Hours: 4
ACC 405 - Accounting Info Sys Credit Hours: 4
WRI 327 - Advanced Tech Writing Credit Hours: 3
Total: 15 Credit Hours

Senior Year Fall
ACC 411 - Income Tax Procedures Credit Hours: 4
ACC 435 - Auditing Credit Hours: 4
ACC 496 - Senior Project Credit Hours: 3
MGT 321 - Operations Management I Credit Hours: 3
Total: 14 Credit Hours

Winter
ACC 412 - Corporate Taxation Credit Hours: 4
ACC 431 - Advanced Accounting I Credit Hours: 4
ACC 497 - Senior Project Credit Hours: 3
BUS 349 - Human Resource Management I Credit Hours: 3
Elective Credit Hours: 3
Total: 17 Credit Hours

Spring
ACC 432 - Advanced Accounting II Credit Hours: 4

ACC 465 - Case Studies in Accounting Credit Hours: 4
or
BUS 478 - Strategic Management Credit Hours: 3

PSY 347 - Organizational Behavior Credit Hours: 3
Elective Credit Hours: 3
Total: 13/14 Credit Hours

Total for a B.S. in Accounting: 182/183 Credit Hours

Business, Management Option, BS

Students selecting the management option will equip themselves to be managers with complete understanding of all aspects of a business. This option provides students with an array of paths to build just the right business tool box to meet their professional goals including business analytics, innovation and entrepreneurship or a customized path.

Curriculum

Required courses and recommended terms during which they should be taken:

Freshman Year Fall
BUS 215 - Principles of Management Credit Hours: 3
MATH 111 - College Algebra Credit Hours: 4
PSY 201 - Psychology Credit Hours: 3
WRI 121 - English Composition Credit Hours: 3
Laboratory Science Elective Credit Hours: 4
Total: 17 Credit Hours

Winter
BUS 223 - Marketing I Credit Hours: 3
ECO 201 - Principles of Microeconomics Credit Hours: 3
MIS 102 - Spreadsheet Software Lab Credit Hours: 1
SPE 111 - Public Speaking Credit Hours: 3
WRI 122 - Argumentative Writing Credit Hours: 3
Elective Credit Hours: 3
Total: 16 Credit Hours

Spring
ECO 202 - Principles of Macroeconomics Credit Hours: 3
MIS 206 - Intro to Mgmt Info Sys Credit Hours: 3
SPE 321 - Small Group/Team Comm Credit Hours: 3
WRI 227 - Technical Report Writing Credit Hours: 3
Humanities Elective Credit Hours: 3
Total: 15 Credit Hours

Sophomore Year Fall
ACC 201 - Prin of Accounting I Credit Hours: 4
MATH 361 - Statistical Methods I Credit Hours: 4

MIS 113 - Intro to Database Systems Credit Hours: 3
or
MIS 275 - Intro to Relational Databases Credit Hours: 4

Humanities Elective Credit Hours: 3
Total: 14/15 Credit Hours

Winter
BUS 226 - Business Law Credit Hours: 3
BUS 349 - Human Resource Management I Credit Hours: 3
MATH 371 - Finite Math/Calc I Credit Hours: 4

PHIL 331 - Ethics in the Professions Credit Hours: 3
or
PHIL 342 - Business Ethics Credit Hours: 3

Program Elective Credit Hours: 3
Total: 16 Credit Hours

Spring
ACC 203 - Prin of Managerial Acct Credit Hours: 4
BUS 456 - Business Research Methods Credit Hours: 3
MIS 375 - Decision Support Systems Credit Hours: 3
Elective Credit Hours: 3
Program Elective Credit Hours: 3
Total: 16 Credit Hours

Junior Year Fall
BUS 467 - Service Management Credit Hours: 3
GIS 207 - Seminar Credit Hours: 1
MGT 321 - Operations Management I Credit Hours: 3
MGT 421 - Quality Management Credit Hours: 3
Program Elective Credit Hours: 3
Total: 13 Credit Hours

Winter
ACC 325 - Finance Credit Hours: 4
BUS 307 - Seminar Credit Hours: 3
BUS 356 - Business Presentations Credit Hours: 4
MIS 334 - Business Analytics Credit Hours: 4
Communication Elective Credit Hours: 3
Total: 18 Credit Hours

Spring
BUS 390 - Applied Management Internship Credit Hours: 3
or
BUS Elective Credit Hours: 3

MGT 335 - Project Management Credit Hours: 3
Elective Credit Hours: 3
Elective Credit Hours: 3
Program Elective Credit Hours: 3
Total: 15 Credit Hours

Senior Year Fall
BUS 308 - Prin of International **Business Credit Hours: 3**
BUS 441 - Leadership I Credit Hours: 3
BUS 457 - Business Research Methods II Credit Hours: 3
BUS 495 - Senior Project Proposal Credit Hours: 1
MGT 461 - Lean/Six Sigma Management I Credit Hours: 3
Total: 15 Credit Hours

Winter
ANTH 452 - Globalization Credit Hours: 3
BUS 496 - Senior Project Credit Hours: 2
PSY 347 - Organizational Behavior Credit Hours: 3
Elective Credit Hours: 3
Program Elective Credit Hours: 3
Total: 15 Credit Hours

Spring
BUS 478 - Strategic Management Credit Hours: 3
BUS 497 - Senior Project Credit Hours: 3
Elective Credit Hours: 3
Program Elective Credit Hours: 3
Total: 12 Credit Hours

Program Electives

ACC 205 - Computerized Accounting Credit Hours: 3
ART 315 - Design Thinking Credit Hours: 3
BUS 107 - Seminar Credit Hours: 15
BUS 256 - Business Communications Credit Hours: 3
BUS 314 - Entrepreneurship I Credit Hours: 3
BUS 318 - Marketing II Credit Hours: 3
BUS 319 - Integrated Marketing Comm. Credit Hours: 3
BUS 326 - Sales/Sales Management Credit Hours: 3
BUS 335 - Entrepreneurship II Credit Hours: 3
BUS 347 - Geography of Travel/Tourism Credit Hours: 3
BUS 390 - Applied Management Internship Credit Hours: 3
BUS 399 - Marketing Special Topics Credit Hours: 3
BUS 434 - Global Marketing Credit Hours: 3
BUS 447 - Controversial Issues in Mgmt Credit Hours: 3
COM 237 - Intro to Visual Communication Credit Hours: 3
COM 248 - Digital Media Production Credit Hours: 3
COM 256 - Public Relations Credit Hours: 3
COM 347 - Negotiation & Conflict Resol'n Credit Hours: 3
GIS 134 - Geographic Info Systems Credit Hours: 3
MGT 462 - Lean/Six Sigma Management II Credit Hours: 3
MGT 463 - Lean/Six Sigma Management III Credit Hours: 3
MIS 118 - Intro to Programming in C# Credit Hours: 4
MIS 225 - Business on the Internet Credit Hours: 4
MIS 341 - Relational Database Design I Credit Hours: 4
MIS 344 - Business Intelligence Credit Hours: 3
MIS 446 - Data Mining Credit Hours: 3
WRI 350 - Documentation Develop Credit Hours: 3

Total for a B.S. in Business, Management Option: 182/183 Credit Hours

Business, Marketing Option, BS

The marketing option provides students with a broad business education and includes a strong emphasis in modern marketing concepts and practices. This degree option focuses on data-driven analytical skills sought by employers including social media and digital marketing. Students learn to analyze an organization's activities to develop and implement a marketing strategy. Marketing graduates enjoy careers in advertising, marketing research, social media marketing, distribution, and sales.

Curriculum

Required courses and recommended terms during which they should be taken:

Freshman Year Fall
BUS 215 - Principles of Management Credit Hours: 3
MATH 111 - College Algebra Credit Hours: 4
PSY 201 - Psychology Credit Hours: 3
WRI 121 - English Composition Credit Hours: 3
Laboratory Science Elective Credit Hours: 4
Total: 17 Credit Hours

Winter
BUS 223 - Marketing I Credit Hours: 3
ECO 201 - Principles of Microeconomics Credit Hours: 3
MIS 102 - Spreadsheet Software Lab Credit Hours: 1
SPE 111 - Public Speaking Credit Hours: 3
WRI 122 - Argumentative Writing Credit Hours: 3
Elective Credit Hours: 3
Total: 16 Credit Hours

Spring
ECO 202 - Principles of Macroeconomics Credit Hours: 3
MIS 206 - Intro to Mgmt Info Sys Credit Hours: 3
SPE 321 - Small Group/Team Comm Credit Hours: 3
WRI 227 - Technical Report Writing Credit Hours: 3
Humanities Elective Credit Hours: 3
Total: 15 Credit Hours

Sophomore Year Fall
ACC 201 - Prin of Accounting I Credit Hours: 4
MATH 361 - Statistical Methods I Credit Hours: 4

MIS 113 - Intro to Database Systems Credit Hours: 3
or
MIS 275 - Intro to Relational Databases Credit Hours: 4

Humanities Elective Credit Hours: 3
Total: 14/15 Credit Hours

Winter
BUS 256 - Business Communications Credit Hours: 3
BUS 318 - Marketing II Credit Hours: 3
BUS 349 - Human Resource Management I Credit Hours: 3
MATH 371 - Finite Math/Calc I Credit Hours: 4

PHIL 331 - Ethics in the Professions Credit Hours: 3
or
PHIL 342 - Business Ethics Credit Hours: 3
Total: 16 Credit Hours

Spring
ACC 203 - Prin of Managerial Acct Credit Hours: 4
BUS 456 - Business Research Methods Credit Hours: 3
MIS 225 - Business on the Internet Credit Hours: 4
MIS 375 - Decision Support Systems Credit Hours: 3
Total: 14 Credit Hours

Junior Year Fall
BUS 319 - Integrated Marketing Comm. Credit Hours: 3
BUS 467 - Service Management Credit Hours: 3
GIS 207 - Seminar Credit Hours: 1
MGT 321 - Operations Management I Credit Hours: 3
Elective Credit Hours: 3
Program Elective Credit Hours: 3
Total: 16 Credit Hours

Winter
ACC 325 - Finance Credit Hours: 4
BUS 226 - Business Law Credit Hours: 3
US 307 - Seminar Credit Hours: 3
Communication Elective Credit Hours: 3
Program Elective Credit Hours: 3
Total: 16 Credit Hours

Spring
BUS 390 - Applied Management Internship Credit Hours: 3
or
BUS Elective Credit Hours: 3

BUS 435 - Marketing III Credit Hours: 3
BUS 473 - Marketing Plan Development Credit Hours: 3
GT 335 - Project Management Credit Hours: 3
Elective Credit Hours: 3
Total: 15 Credit Hours

Senior Year Fall
BUS 308 - Prin of International Business Credit Hours: 3

BUS 414 - Marketing Research Credit Hours: 3
or
BUS 457 - Business Research Methods II Credit Hours: 3

BUS 441 - Leadership I Credit Hours: 3
BUS 495 - Senior Project Proposal Credit Hours: 1
PSY 347 - Organizational Behavior Credit Hours: 3
Total: 15 Credit Hours

Winter
ANTH 452 - Globalization Credit Hours: 3
BUS 356 - Business Presentations Credit Hours: 4
BUS 496 - Senior Project Credit Hours: 2
Elective Credit Hours: 3
Program Elective Credit Hours: 3
Total: 16 Credit Hours

Spring
BUS 478 - Strategic Management Credit Hours: 3
BUS 497 - Senior Project Credit Hours: 3
Program Elective Credit Hours: 3
Program Elective Credit Hours: 3
Total: 12 Credit Hours

Program Electives

ACC 205 - Computerized Accounting Credit Hours: 3
ART 215 - Design Arts and Aesthetics Credit Hours: 3
ART 226 - Digital Photography Credit Hours: 3
ART 315 - Design Thinking Credit Hours: 3
BUS 107 - Seminar Credit Hours: 15
BUS 314 - Entrepreneurship I Credit Hours: 3
BUS 326 - Sales/Sales Management Credit Hours: 3
BUS 335 - Entrepreneurship II Credit Hours: 3
BUS 347 - Geography of Travel/Tourism Credit Hours: 3
BUS 390 - Applied Management Internship Credit Hours: 3
BUS 399 - Marketing Special Topics Credit Hours: 3
BUS 434 - Global Marketing Credit Hours: 3
BUS 447 - Controversial Issues in Mgmt Credit Hours: 3
COM 237 - Intro to Visual Communication Credit Hours: 3
COM 248 - Digital Media Production Credit Hours: 3
COM 256 - Public Relations Credit Hours: 3
COM 347 - Negotiation & Conflict Resol'n Credit Hours: 3
GIS 134 - Geographic Info Systems Credit Hours: 3
MGT 461 - Lean/Six Sigma Management I Credit Hours: 3
MGT 462 - Lean/Six Sigma Management II Credit Hours: 3
MGT 463 - Lean/Six Sigma Management III Credit Hours: 3
MIS 118 - Intro to Programming in C# Credit Hours: 4
MIS 334 - Business Analytics Credit Hours: 4
MIS 341 - Relational Database Design I Credit Hours: 4
MIS 344 - Business Intelligence Credit Hours: 3
MIS 446 - Data Mining Credit Hours: 3
WRI 350 - Documentation Develop Credit Hours: 3

Total for a B.S. in Business, Marketing Option: 182/183 Credit Hours

Cybersecurity (Klamath Falls Campus), BS

The BS in Cybersecurity provides students with the knowledge and skills necessary to competently scan, assess, report, and mitigate cybersecurity threats, vulnerabilities, and exploits on information systems and technology. A graduate of the BS in Cybersecurity program is prepared to assess the security needs of computer and network systems, recommend safeguard solutions, and manage the implementation and maintenance of security devices, systems, and procedures. Includes instruction in computer architecture, scripting, systems analysis, networking, cryptography, security system design, applicable law and regulations, risk assessment and policy analysis, contingency planning, user access issues, investigation techniques, and troubleshooting.

Curriculum

Required courses and recommended terms during which they should be taken:

Freshman Year Fall
MATH 111 - College Algebra Credit Hours: 4
SPE 111 - Public Speaking Credit Hours: 3
WRI 121 - English Composition Credit Hours: 3
Laboratory Science Elective Credit Hours: 4
Total: 14 Credit Hours

Winter
ECO 201 - Principles of Microeconomics Credit Hours: 3
MATH 112 - Trigonometry Credit Hours: 4
MIS 102 - Spreadsheet Software Lab Credit Hours: 1
MIS 145 - Intro to PC Hardware/Software Credit Hours: 4
WRI 122 - Argumentative Writing Credit Hours: 3
Total: 15 Credit Hours

Spring
BUS 215 - Principles of Management Credit Hours: 3
MIS 251 - Networking I Credit Hours: 4
MIS 275 - Intro to Relational Databases Credit Hours: 4
MIS 285 - Python Programming Credit Hours: 4
Total: 15 Credit Hours

Sophomore Year Fall
ACC 201 - Prin of Accounting I Credit Hours: 4
MIS 118 - Intro to Programming in C# Credit Hours: 4
MIS 273 - Systems Administration I Credit Hours: 4
WRI 227 - Technical Report Writing Credit Hours: 3
Total: 15 Credit Hours

Winter
BUS 226 - Business Law Credit Hours: 3
CYB 201 - Cybersecurity Fundamentals Credit Hours: 3
MATH 361 - Statistical Methods I Credit Hours: 4
MIS 218 - Intermediate Programming in C# Credit Hours: 4

PHIL 331 - Ethics in the Professions Credit Hours: 3
or
PHIL 342 - Business Ethics Credit Hours: 3
Total: 17 Credit Hours

Spring
ACC 203 - Prin of Managerial Acct Credit Hours: 4
ECO 202 - Principles of Macroeconomics Credit Hours: 3
MGT 335 - Project Management Credit Hours: 3
MIS 240 - Intro to Linux OS Credit Hours: 4
SPE 321 - Small Group/Team Comm Credit Hours: 3
Total: 17 Credit Hours

Junior Year Fall
ACC 325 - Finance Credit Hours: 4
CYB 301 - Hacker Tools and Techniques Credit Hours: 4
MIS 311 - Intro to Systems Analysis Credit Hours: 3
MIS 351 - Networking II Credit Hours: 4
Humanities Elective Credit Hours: 3
Total: 18 Credit Hours

Winter
CYB 302 - System Defenses and Incident Response Credit Hours: 4
MIS 312 - Systems Analysis I Credit Hours: 4
MIS 334 - Business Analytics Credit Hours: 4
MIS 341 - Relational Database Design I Credit Hours: 4

WRI 327 - Advanced Tech Writing Credit Hours: 3
or
WRI 350 - Documentation Develop Credit Hours: 3
Total: 19 Credit Hours

Spring
BUS 223 - Marketing I Credit Hours: 3
CYB 303 - Security Operations and Analysis Credit Hours: 4
CYB 351 - Network Security Credit Hours: 4
MIS 322 - Systems Analysis II Credit Hours: 4
MIS 495 - Senior Project Selection Credit Hours: 1
Total: 16 Credit Hours

Senior Year Fall
CYB 411 - Managing Risk in Information Systems Credit Hours: 3
MGT 321 - Operations Management I Credit Hours: 3
MIS 365 - Cloud Computing Credit Hours: 4
MIS 496 - Senior Project Management Credit Hours: 3
Total: 13 Credit Hours

Winter
BUS 349 - Human Resource Management I Credit Hours: 3
BUS 356 - Business Presentations Credit Hours: 4
MIS 497 - Senior Project II Credit Hours: 3
PSY 347 - Organizational Behavior Credit Hours: 3
Total: 13 Credit Hours

Spring
ANTH 452 - Globalization Credit Hours: 3
BUS 478 - Strategic Management Credit Hours: 3
MIS 498 - Senior Project III Credit Hours: 3
Humanities Elective Credit Hours: 3
Total: 12 Credit Hours

Total for a B.S. in Cybersecurity: 184 Credit Hours

Cybersecurity (Portland-Metro Campus), BS

The BS in Cybersecurity provides students with the knowledge and skills necessary to competently scan, assess, report, and mitigate cybersecurity threats, vulnerabilities, and exploits on information systems and technology. A graduate of the BS in Cybersecurity program is prepared to assess the security needs of computer and network systems, recommend safeguard solutions, and manage the implementation and maintenance of security devices, systems, and procedures. Includes instruction in computer architecture, scripting, systems analysis, networking, cryptography, security system design, applicable law and regulations, risk assessment and policy analysis, contingency planning, user access issues, investigation techniques, and troubleshooting.

Curriculum

Required courses and recommended terms during which they should be taken:

Freshman Year Fall
MATH 111 - College Algebra Credit Hours: 4
MIS 145 - Intro to PC Hardware/Software Credit Hours: 4
MIS 285 - Python Programming Credit Hours: 4
WRI 121 - English Composition Credit Hours: 3
Total: 15 Credit Hours

Winter
MATH 112 - Trigonometry Credit Hours: 4
MIS 102 - Spreadsheet Software Lab Credit Hours: 1
MIS 251 - Networking I Credit Hours: 4
WRI 122 - Argumentative Writing Credit Hours: 3
Humanities Elective Credit Hours: 3
Total: 15 Credit Hours

Spring
ECO 201 - Principles of Microeconomics Credit Hours: 3
MIS 118 - Intro to Programming in C# Credit Hours: 4
MIS 273 - Systems Administration I Credit Hours: 4
SPE 111 - Public Speaking Credit Hours: 3
Humanities Elective Credit Hours: 4
Total: 17 Credit Hours

Sophomore Year Fall
ACC 201 - Prin of Accounting I Credit Hours: 4
BUS 215 - Principles of Management Credit Hours: 3
MIS 275 - Intro to Relational Databases Credit Hours: 4
WRI 227 - Technical Report Writing Credit Hours: 3
Lab Science Elective Credit Hours: 4
Total: 18 Credit Hours

Winter
ACC 203 - Prin of Managerial Acct Credit Hours: 4
BUS 226 - Business Law Credit Hours: 3
CYB 201 - Cybersecurity Fundamentals Credit Hours: 3
ECO 202 - Principles of Macroeconomics Credit Hours: 3

PHIL 331 - Ethics in the Professions Credit Hours: 3
or
PHIL 342 - Business Ethics Credit Hours: 3
Total: 16 Credit Hours

Spring
BUS 223 - Marketing I Credit Hours: 3
MGT 335 - Project Management Credit Hours: 3
MIS 218 - Intermediate Programming in C# Credit Hours: 4
MIS 240 - Intro to Linux OS Credit Hours: 4
SPE 321 - Small Group/Team Comm Credit Hours: 3
Total: 17 Credit Hours

Junior Year Fall
CYB 301 - Hacker Tools and Techniques Credit Hours: 4
MATH 361 - Statistical Methods I
MIS 311 - Intro to Systems Analysis Credit Hours: 3
MIS 351 - Networking II Credit Hours: 4
Total: 15 Credit Hours

Winter
CYB 351 - System Defenses and Incident Response Credit Hours: 4
MIS 312 - Systems Analysis I Credit Hours: 4
MIS 334 - Business Analytics Credit Hours: 4
MIS 341 - Relational Database Design I Credit Hours: 4
Total: 16 Credit Hours

Spring
ACC 325 - Finance Credit Hours: 4
CYB 303 - Security Operations and Analysis Credit Hours: 4
MIS 322 - Systems Analysis II Credit Hours: 4
MIS 495 - Senior Project Selection Credit Hours: 1
Total: 13 Credit Hours

Senior Year Fall
CYB 411 - Managing Risk in Information Systems Credit Hours: 3
MGT 321 - Operations Management I Credit Hours: 3
MIS 365 - Cloud Computing Credit Hours: 4
MIS 496 - Senior Project Management Credit Hours: 3
Total: 13 Credit Hours

Winter
BUS 349 - Human Resource Management I Credit Hours: 3
BUS 356 - Business Presentations Credit Hours: 4
CYB 302 System Defenses and Incident Response Credit Hours: 4
MIS 497 - Senior Project II Credit Hours: 3
PSY 347 - Organizational Behavior Credit Hours: 3
Total: 17 Credit Hours

Spring
ANTH 452 - Globalization Credit Hours: 3
or
HIST 452 - Globalization & Pac NW Credit Hours: 3

BUS 478 - Strategic Management Credit Hours: 3
MIS 498 - Senior Project III Credit Hours: 3

WRI 327 - Advanced Tech Writing Credit Hours: 3
or
WRI 350 - Documentation Develop Credit Hours: 3
Total: 12 Credit Hours

Total for a B.S. in Cybersecurity: 184 Credit Hours

Health Care Management, Administration Option, BS

Administration Option

This program offers a BS in Health Care Management to students whose interests lie in business and health care administration. The curriculum is designed to prepare the graduate for entry- and mid-level management positions and/or for graduate programs in Health Care Administration, Hospital Administration or Public Health. Based on a core of common management courses, the program builds a broader base of understanding of health care in the U.S. and its systems, policies and challenges. Students selecting the Administration option will complete a Health Informatics Minor as part of their studies. Students will also choose a second minor/series of focused program electives in: Applied Health Data Analytics, Applied Medical Sociology, or Psychology. During their senior year, students will complete a capstone project or internship.

Curriculum

Required courses and recommended terms during which they should be taken:

Freshman Year Fall
BIO 200 - Medical Terminology Credit Hours: 2
MATH 111 - College Algebra Credit Hours: 4
MIS 255 - Health Informatics Cpts & Prct Credit Hours: 3
PSY 201 - Psychology Credit Hours: 3
WRI 121 - English Composition Credit Hours: 3
Total: 15 Credit Hours

Winter
BUS 223 - Marketing I Credit Hours: 3
or
BUS 337 - Prin of Health Care Marketing Credit Hours: 3

ECO 201 - Principles of Microeconomics Credit Hours: 3
MIS 102 - Spreadsheet Software Lab Credit Hours: 1
SPE 111 - Public Speaking Credit Hours: 3
WRI 122 - Argumentative Writing Credit Hours: 3
Total: 13 Credit Hours

Spring
ECO 202 - Principles of Macroeconomics Credit Hours: 3
SOC 204 - Intro to Sociology Credit Hours: 3
SPE 321 - Small Group/Team Comm Credit Hours: 3
WRI 227 - Technical Report Writing Credit Hours: 3
Elective Credit Hours: 3
Total: 15 Credit Hours

Sophomore Year Fall
ACC 201 - Prin of Accounting I Credit Hours: 4

BIO 103 - Intro to Human Anat & Phys Credit Hours: 4
or
BIO 231 - Human Anatomy/Physiology I Credit Hours: 4

BUS 313 - Health Care Systems & Policy Credit Hours: 3

MIS 113 - Intro to Database Systems Credit Hours: 3
or
MIS 275 - Intro to Relational Databases Credit Hours: 4
Total: 14/15 Credit Hours

Winter
BUS 316 - Total Quality Health Care Credit Hours: 3
COM 205 - Intercultural Comm Credit Hours: 3
MATH 361 - Statistical Methods I Credit Hours: 4
Humanities Elective Credit Hours: 3
Program Elective Credit Hours: 3
Total: 16 Credit Hours

Spring
ACC 203 - Prin of Managerial Acct Credit Hours: 4
BUS 317 - Health Care Management Credit Hours: 3
SOC 225 - Medical Sociology Credit Hours: 3
Elective Credit Hours: 3
Elective Credit Hours: 3
Total: 16 Credit Hours

Junior Year Fall
ACC 325 - Finance Credit Hours: 4
BUS 308 - Prin of International Business Credit Hours: 3
MGT 321 - Operations Management I Credit Hours: 3
MIS 445 - Legal/Eth/Soc Iss in HC Tech Credit Hours: 3
Program Elective Credit Hours: 3
Total: 16 Credit Hours

Winter
BUS 349 - Human Resource Management I Credit Hours: 3
PHIL 342 - Business Ethics Credit Hours: 3
STAT 414 - Stat Methods in Epidemiology Credit Hours: 4
Program Elective Credit Hours: 3
Program Elective Credit Hours: 3
Total: 16 Credit Hours

Spring
BUS 356 - Business Presentations Credit Hours: 4
MGT 335 - Project Management Credit Hours: 3
Humanities Elective Credit Hours: 3
Program Elective Credit Hours: 3
Program Elective Credit Hours: 3
Total: 16 Credit Hours

Senior Year Fall
BUS 441 - Leadership I Credit Hours: 3
BUS 457 - Business Research Methods II Credit Hours: 3
BUS 467 - Service Management Credit Hours: 3
BUS 495 - Senior Project Proposal Credit Hours: 1
MIS 345 - Health Care Info Systms Mgment Credit Hours: 3
Total: 15 Credit Hours

Winter
BUS 496 - Senior Project Credit Hours: 2
MIS 357 - Info & Comm Systs in Hlth Care Credit Hours: 3
Elective Credit Hours: 3
Elective Credit Hours: 3
Program Elective Credit Hours: 3
Total: 15 Credit Hours

Spring
BUS 478 - Strategic Management Credit Hours: 3
BUS 497 - Senior Project Credit Hours: 3
PSY 347 - Organizational Behavior Credit Hours: 3
Elective Credit Hours: 3
Program Elective Credit Hours: 3
Total: 15 Credit Hours

Program Electives
Students may choose to mix and match these.

Health Data Analytics Track:
MIS 118 - Intro to Programming in C# Credit Hours: 4
MIS 334 - Business Analytics Credit Hours: 4
MIS 341 - Relational Database Design I Credit Hours: 4
MIS 344 - Business Intelligence Credit Hours: 3
MIS 446 - Data Mining Credit Hours: 3
BUS Elective Credit Hours: 3
COM Elective Credit Hours: 3

Medical Sociology Track:
BUS 256 - Business Communications Credit Hours: 3
BUS 397 - Human Resource Management II Credit Hours: 3
BUS 442 - Leadership II Credit Hours: 3
COM 346 - Health Communication Credit Hours: 3
PSY 336 - Health Psychology I Credit Hours: 3
SOC 325 - Global Population Health Credit Hours: 3
SOC 335 - Hlth Inequal & Cult Competency Credit Hours: 3
WRI 410 - Proposal & Grant Writing Credit Hours: 3

Psychology Track:
PSY 202 - Psychology Credit Hours: 3
PSY 203 - Psychology Credit Hours: 3
BUS Elective Credit Hours: 3
COM Elective Credit Hours: 3
Lower/Upper PSY Elective Credit Hours: 3
Upper Division Elective Credit Hours: 3
Upper Division PSY Elective Credit Hours: 3
Upper Division PSY Elective Credit Hours: 3

Total for a B.S. in Health Care Management, Administration Option: 182/183 Credit Hours

Health Care Management, Clinical Option, BS

Clinical Option

This program bridges two disciplines; Allied Health and Management. The clinical option requires a current state and/or national registry, license or certificate in an approved allied health field. The degree prepares Allied Health professionals for advancement to management or supervisory roles. During their senior year, students will complete a capstone project or internship.

Curriculum

Required courses and recommended terms during which they should be taken:

Prior Learning
Registry Transfer Credits Credit Hours: 44

Sophomore Year Fall
ACC 201 - Prin of Accounting I Credit Hours: 4

BIO 103 - Intro to Human Anat & Phys Credit Hours: 4
or
BIO 231 - Human Anatomy/Physiology I Credit Hours: 4

SPE 111 - Public Speaking Credit Hours: 3
WRI 121 - English Composition Credit Hours: 3
Total: 14 Credit Hours

Winter
MATH 111 - College Algebra Credit Hours: 4
MIS 102 - Spreadsheet Software Lab Credit Hours: 1
WRI 122 - Argumentative Writing Credit Hours: 3
Elective Credit Hours: 3
Math/Science Elective Credit Hours: 4
Total: 15 Credit Hours

Spring
ACC 203 - Prin of Managerial Acct Credit Hours: 4
BUS 226 - Business Law Credit Hours: 3
BUS 317 - Health Care Management Credit Hours: 3
WRI 227 - Technical Report Writing Credit Hours: 3
Elective Credit Hours: 3
Total: 16 Credit Hours

Junior Year Fall
ACC 325 - Finance Credit Hours: 4
BUS 308 - Prin of International Business Credit Hours: 3
BUS 313 - Health Care Systems & Policy Credit Hours: 3
MIS 113 - Intro to Database Systems Credit Hours: 3
SY 201 - Psychology Credit Hours: 3
Total: 16 Credit Hours

Winter
BIO 200 - Medical Terminology Credit Hours: 2
BUS 349 - Human Resource Management I Credit Hours: 3
ECO 201 - Principles of Microeconomics Credit Hours: 3

MATH 243 - Introductory Statistics Credit Hours: 4
or
MATH 361 - Statistical Methods I Credit Hours: 4

PHIL 331 - Ethics in the Professions Credit Hours: 3
or
PHIL 342 - Business Ethics Credit Hours: 3
Total: 15 Credit Hours

Spring
BUS 356 - Business Presentations Credit Hours: 4

BUS 223 - Marketing I Credit Hours: 3
or
BUS 337 - Prin of Health Care Marketing Credit Hours: 3

ECO 202 - Principles of Macroeconomics Credit Hours: 3
MGT 335 - Project Management Credit Hours: 3
SPE 321 - Small Group/Team Comm Credit Hours: 3
Total: 16 Credit Hours

Senior Year Fall
BUS 441 - Leadership I Credit Hours: 3
BUS 457 - Business Research Methods II Credit Hours: 3
BUS 467 - Service Management Credit Hours: 3
BUS 495 - Senior Project Proposal Credit Hours: 1
MIS 345 - Health Care Info Systms Mgment Credit Hours: 3
Total: 15 Credit Hours

Winter
BUS 316 - Total Quality Health Care Credit Hours: 3
BUS 496 - Senior Project Credit Hours: 2
COM 205 - Intercultural Comm Credit Hours: 3
Upper Division Elective Credit Hours: 3
Humanities Elective Credit Hours: 3
Total: 15 Credit Hours

Spring
BUS 478 - Strategic Management Credit Hours: 3
BUS 497 - Senior Project Credit Hours: 3
PSY 347 - Organizational Behavior Credit Hours: 3
WRI 410 - Proposal & Grant Writing Credit Hours: 3
Humanities Elective Credit Hours: 3
Total: 15 Credit Hours

Total for a B.S. in Health Care Management, Clinical Option: 181 Credit Hours

Health Care Management, Radiological Science Management Option, BS

This program offers a BS in Health Care Management to students who hold a current registry through the American Registry of Radiologic Technologists (ARRT) and who wish to enhance their career by obtaining a management degree with emphasis on management of a medical imaging facility or department. It is designed for the radiologic technologist seeking skills and credentials that enable advancement to positions of middle management. During their senior year, students will complete a capstone project or internship.

The BS degree in Health Care Management, Radiologic Science Management Option is fully online with no requirement to come to campus and does not require clinical practice involving patient contact.

Curriculum

This curriculum map is arranged in the typical term by term format; however, online degree completion students should consult with their academic advisor regarding course scheduling.

Prior Learning
Registry Transfer Credits Credit Hours: 89

Sophomore Year Fall
ACC 201 - Prin of Accounting I Credit Hours: 4
MIS 113 - Intro to Database Systems Credit Hours: 3
SPE 111 - Public Speaking Credit Hours: 3
WRI 121 - English Composition Credit Hours: 3
Total: 13 Credit Hours

Winter
BIO 200 - Medical Terminology Credit Hours: 2
MATH 111 - College Algebra Credit Hours: 4
MIS 102 - Spreadsheet Software Lab Credit Hours: 1
SPE 321 - Small Group/Team Comm Credit Hours: 3
WRI 122 - Argumentative Writing Credit Hours: 3
Total: 13 Credit Hours

Spring
ACC 203 - Prin of Managerial Acct Credit Hours: 4

BUS 223 - Marketing I Credit Hours: 3
or
BUS 337 - Prin of Health Care Marketing Credit Hours: 3

ECO 201 - Principles of Microeconomics Credit Hours: 3
WRI 227 - Technical Report Writing Credit Hours: 3
Total: 13 Credit Hours

Junior Year Fall
ACC 325 - Finance Credit Hours: 4

BIO 103 - Intro to Human Anat & Phys Credit Hours: 4
or
BIO 231 - Human Anatomy/Physiology I Credit Hours: 4

BUS 313 - Health Care Systems & Policy Credit Hours: 3

MATH 243 - Introductory Statistics Credit Hours: 4
or
MATH 361 - Statistical Methods I Credit Hours: 4
Total: 15 Credit Hours

Winter
ECO 202 - Principles of Macroeconomics Credit Hours: 3

PSY 201 - Psychology Credit Hours: 3
or
PSY 202 - Psychology Credit Hours: 3
or
PSY 203 - Psychology Credit Hours: 3

Math/Science Elective Credit Hours: 4
Humanities Elective Credit Hours: 3
Total: 13 Credit Hours

Spring
BUS 226 - Business Law Credit Hours: 3
BUS 317 - Health Care Management Credit Hours: 3
BUS 356 - Business Presentations Credit Hours: 4
MGT 335 - Project Management Credit Hours: 3
Total: 13 Credit Hours

Senior Year Fall
BUS 308 - Prin of International Business Credit Hours: 3
BUS 457 - Business Research Methods II Credit Hours: 3
BUS 495 - Senior Project Proposal Credit Hours: 1
IS 345 - Health Care Info Systms Mgment Credit Hours: 3
Total: 12 Credit Hours

Winter
BUS 316 - Total Quality Health Care Credit Hours: 3
BUS 496 - Senior Project Credit Hours: 2

PHIL 331 - Ethics in the Professions Credit Hours: 3
or
PHIL 342 - Business Ethics Credit Hours: 3

PSY 347 - Organizational Behavior Credit Hours: 3
Total: 12 Credit Hours

Spring
BUS 478 - Strategic Management Credit Hours: 3
BUS 497 - Senior Project Credit Hours: 3
WRI 410 - Proposal & Grant Writing Credit Hours: 3
Humanities Elective Credit Hours: 3
Total: 12 Credit Hours

Total for a B.S. in Health Care Management, Radiologic Science Option: 205 Credit Hours

Health Informatics, BS

Health Informatics is a rapidly developing scientific field that utilizes computer technology to improve the quality and safety of patient care. This program incorporates the sub disciplines of clinical and computational informatics; emphasizing the integration of computer science and the impact of clinical outcomes. Internship opportunities are available during the senior year. Students will complete a capstone course and a senior project.

Curriculum

Required courses and recommended terms during which they should be taken:

Freshman Year Fall
MATH 111 - College Algebra Credit Hours: 4
MIS 255 - Health Informatics Cpts & Prct Credit Hours: 3
SPE 111 - Public Speaking Credit Hours: 3
WRI 121 - English Composition Credit Hours: 3
Elective Credit Hours: 3
Total: 16 Credit Hours

Winter
BIO 200 - Medical Terminology Credit Hours: 2
ECO 201 - Principles of Microeconomics Credit Hours: 3
MIS 102 - Spreadsheet Software Lab Credit Hours: 1
MIS 145 - Intro to PC Hardware/Software Credit Hours: 4
WRI 122 - Argumentative Writing Credit Hours: 3
Humanities Elective Credit Hours: 3
Total: 16 Credit Hours

Spring
BUS 317 - Health Care Management Credit Hours: 3
ECO 202 - Principles of Macroeconomics Credit Hours: 3
MIS 251 - Networking I Credit Hours: 4
MIS 275 - Intro to Relational Databases Credit Hours: 4
Total: 14 Credit Hours

Sophomore Year Fall
ACC 201 - Prin of Accounting I Credit Hours: 4
MATH 361 - Statistical Methods I Credit Hours: 4
MIS 118 - Intro to Programming in C# Credit Hours: 4
WRI 227 - Technical Report Writing Credit Hours: 3
Total: 15 Credit Hours

Winter
BUS 223 - Marketing I Credit Hours: 3
or
BUS 337 - Prin of Health Care Marketing Credit Hours: 3

MATH 362 - Statistical Methods II Credit Hours: 4
MIS 218 - Intermediate Programming in C# Credit Hours: 4
MIS 357 - Info & Comm Systs in Hlth Care Credit Hours: 3
Total: 14 Credit Hours

Spring
ACC 203 - Prin of Managerial Acct Credit Hours: 4
BIO 103 - Intro to Human Anat & Phys Credit Hours: 4
MGT 335 - Project Management Credit Hours: 3
OC 225 - Medical Sociology Credit Hours: 3
SPE 321 - Small Group/Team Comm Credit Hours: 3
Total: 17 Credit Hours

Junior Year Fall
ACC 325 - Finance Credit Hours: 4
BUS 313 - Health Care Systems & Policy Credit Hours: 3
BUS 356 - Business Presentations Credit Hours: 4
MIS 311 - Intro to Systems Analysis Credit Hours: 3
General Elective Credit Hours: 3
Total: 17 Credit Hours

Winter
MIS 312 - Systems Analysis I Credit Hours: 4
MIS 334 - Business Analytics Credit Hours: 4
MIS 341 - Relational Database Design I Credit Hours: 4
General Elective Credit Hours: 3
Total: 15 Credit Hours

Spring
BUS 316 - Total Quality Health Care Credit Hours: 3
MIS 322 - Systems Analysis II Credit Hours: 4
MIS 344 - Business Intelligence Credit Hours: 3
MIS 442 - Adv Database App Programming Credit Hours: 4
MIS 495 - Senior Project Selection Credit Hours: 1
Total: 15 Credit Hours

Senior Year Fall
BUS 457 - Business Research Methods II Credit Hours: 3
MIS 345 - Health Care Info Systms Mgment Credit Hours: 3
MIS 445 - Legal/Eth/Soc Iss in HC Tech Credit Hours: 3
MIS 496 - Senior Project Management Credit Hours: 3
Total: 12 Credit Hours

Winter
ANTH 452 - Globalization Credit Hours: 3
MIS 497 - Senior Project II Credit Hours: 3

PHIL 305 - Medical Ethics Credit Hours: 3
or
PHIL 331 - Ethics in the Professions Credit Hours: 3
or
PHIL 342 - Business Ethics Credit Hours: 3

STAT 414 - Stat Methods in Epidemiology Credit Hours: 4
Humanities Elective Credit Hours: 3
Total: 16 Credit Hours

Spring
BUS 478 - Strategic Management Credit Hours: 3
MIS 446 - Data Mining Credit Hours: 3
MIS 498 - Senior Project III Credit Hours: 3
PSY 347 - Organizational Behavior Credit Hours: 3
WRI 410 - Proposal & Grant Writing Credit Hours: 3
Total: 15 Credit Hours

Total for a B.S. in Health Informatics: 182 Credit Hours

Information Technology, BS

Information Technology powers modern business. This field is interdisciplinary, with applications to all aspects of the economy. Students solve real-world business problems and gain critical skills and hands-on experience in networking, server administration, programming, databases, information security, and systems analysis. Graduating students are prepared to bridge the technology and management disciplines in their organizations. Internship opportunities are available during the senior year. Students will complete a capstone course and a senior project.

Curriculum

Required courses and recommended terms during which they should be taken:

Freshman Year Fall
MATH 111 - College Algebra Credit Hours: 4
SPE 111 - Public Speaking Credit Hours: 3
WRI 121 - English Composition Credit Hours: 3
Laboratory Science Elective Credit Hours: 4
Total: 14 Credit Hours

Winter
ECO 201 - Principles of Microeconomics Credit Hours: 3
MIS 102 - Spreadsheet Software Lab Credit Hours: 1
MIS 145 - Intro to PC Hardware/Software Credit Hours: 4
PHIL 205 - Introduction to Logic Credit Hours: 3
WRI 122 - Argumentative Writing Credit Hours: 3
Total: 14 Credit Hours

Spring
BUS 215 - Principles of Management Credit Hours: 3
ECO 202 - Principles of Macroeconomics Credit Hours: 3
MIS 251 - Networking I Credit Hours: 4
MIS 275 - Intro to Relational Databases Credit Hours: 4
Humanities Elective Credit Hours: 3
Total: 17 Credit Hours

Sophomore Year Fall
ACC 201 - Prin of Accounting I Credit Hours: 4
MIS 118 - Intro to Programming in C# Credit Hours: 4
MIS 273 - Systems Administration I Credit Hours: 4
WRI 227 - Technical Report Writing Credit Hours: 3
Total: 15 Credit Hours

Winter
BUS 223 - Marketing I Credit Hours: 3
CYB 201 - Cybersecurity Fundamentals Credit Hours: 3
MATH 361 - Statistical Methods I Credit Hours: 4
MIS 218 - Intermediate Programming in C# Credit Hours: 4

PHIL 331 - Ethics in the Professions Credit Hours: 3
or
PHIL 342 - Business Ethics Credit Hours: 3
Total: 17 Credit Hours

Spring
ACC 203 - Prin of Managerial Acct Credit Hours: 4
MATH 362 - Statistical Methods II Credit Hours: 4
MGT 335 - Project Management Credit Hours: 3
SPE 321 Small Group/Team Comm Credit Hours: 3
Elective Credit Hours: 3
Total: 17 Credit Hours

Junior Year Fall
ACC 325 - Finance Credit Hours: 4
MIS 311 - Intro to Systems Analysis Credit Hours: 3
Focused Sequence Elective Credit Hours: 4 [a]
Focused Sequence Elective Credit Hours: 4 [a]
Total: 15 Credit Hours

Winter
MIS 312 - Systems Analysis I Credit Hours: 4
MIS 334 - Business Analytics Credit Hours: 4
MIS 341 - Relational Database Design I Credit Hours: 4

WRI 327 - Advanced Tech Writing Credit Hours: 3
or
WRI 350 - Documentation Develop Credit Hours: 3
Total: 15 Credit Hours

Spring
BUS 226 - Business Law Credit Hours: 3
MIS 322 - Systems Analysis II Credit Hours: 4
MIS 495 - Senior Project Selection Credit Hours: 1
Elective Credit Hours: 4
Focused Sequence Elective Credit Hours: 4 [a]
Total: 15 Credit Hours

Senior Year Fall
CYB 411 - Managing Risk in Information Systems Credit Hours: 3
MGT 321 - Operations Management I Credit Hours: 3
MIS 496 - Senior Project Management Credit Hours: 3
PSY 347 - Organizational Behavior Credit Hours: 3
Focused Sequence Elective Credit Hours: 4 [a]
Total: 16 Credit Hours

Winter
BUS 349 - Human Resource Management I Credit Hours: 3
BUS 356 - Business Presentations Credit Hours: 4
MIS 497 - Senior Project II Credit Hours: 3
Focused Sequence Elective Credit Hours: 4 [a]
Total: 14 Credit Hours

Spring
ANTH 452 Globalization Credit Hours: 3
or
HIST 452 Globalization & Pac NW

BUS 478 - Strategic Management Credit Hours: 3
MIS 498 - Senior Project III Credit Hours: 3
Focused Sequence Elective Credit Hours: 4 [a]
Total: 13 Credit Hours

Total for a B.S. in Information Technology: 182 Credit Hours

[a] Students will select a 24-unit track listed as their focus elective sequence and will complete a senior project related to the track chosen.

Focused Electives

Students will select a 24-unit track listed as their focus elective sequence and will complete a senior project related to the track chosen.

Business Application Programming

MIS 280 - Web Development Fundamentals Credit Hours: 4
MIS 285 - Python Programming Credit Hours: 4
MIS 442 - Adv Database App Programming Credit Hours: 4
Programming Elective Credit Hours: 4
Programming Elective Credit Hours: 4
Programming Elective Credit Hours: 4

Data Administration and Architecture

MIS 280 - Web Development Fundamentals Credit Hours: 4
MIS 344 - Business Intelligence Credit Hours: 3
MIS 365 - Cloud Computing Credit Hours: 4
MIS 441 - Big Data Credit Hours: 4
MIS 442 - Adv Database App Programming Credit Hours: 4
MIS 446 - Data Mining Credit Hours: 3
Elective Credit Hours: 1
Elective Credit Hours: 1

Data Infrastructure and Networking

CYB 351 - Network Security Credit Hours: 4
MIS 240 - Intro to Linus OS Credit Hours: 4
MIS 285 - Python Programming Credit Hours: 4
MIS 351 - Networking II Credit Hours: 4
MIS 365 - Cloud Computing Credit Hours: 4
MIS 441 - Big Data Credit Hours: 4

Health Informatics (Includes HI Minor)

BUS 313 - Health Care Systems & Policy Credit Hours: 3
MIS 255 - Health Informatics Cpts & Prct Credit Hours: 3
MIS 344 - Business Intelligence Credit Hours: 3
MIS 345 - Health Care Info Systems Mgment Credit Hours: 3
MIS 357 - Info & Comm Systs in Hlth Care Credit Hours 3
MIS 446 - Data Mining Credit Hours: 3
STAT 414 - Stat Methods in Epidemiology Credit Hours: 4
Elective Credit Hours: 1
Elective Credit Hours: 1

Operations Management, BS

Operations Managers coordinate equipment, materials, human capital and information across businesses to profitably meet or exceed customer expectations. Students in Operations Management successfully blend the art of management with applied science through creativity, people skills, rational analysis and application of technology.

Curriculum

Required courses and recommended terms during which they should be taken:

Freshman Year Fall
BUS 215 - Principles of Management Credit Hours: 3
SY 201 - Psychology Credit Hours: 3
WRI 121 - English Composition Credit Hours: 3
Humanities Elective Credit Hours: 3
Total: 12 Credit Hours

Winter
MATH 111 - College Algebra Credit Hours: 4
MIS 102 - Spreadsheet Software Lab Credit Hours: 1
SPE 111 - Public Speaking Credit Hours: 3
WRI 122 - Argumentative Writing Credit Hours: 3
Elective Credit Hours: 3
Total: 14 Credit Hours

Spring
BUS 223 - Marketing I Credit Hours: 3
ECO 201 - Principles of Microeconomics Credit Hours: 3
MIS 206 - Intro to Mgmt Info Sys Credit Hours: 3
WRI 227 - Technical Report Writing Credit Hours: 3
Humanities Elective Credit Hours: 3
Total: 15 Credit Hours

Sophomore Year Fall
ACC 201 - Prin of Accounting I Credit Hours: 4
MATH 361 - Statistical Methods I Credit Hours: 4
MIS 113 - Intro to Database Systems Credit Hours: 3
Elective Credit Hours: 3
Elective Credit Hours: 3
Total: 17 Credit Hours

Winter
BUS 226 - Business Law Credit Hours: 3
ECO 202 - Principles of Macroeconomics Credit Hours: 3
MATH 371 - Finite Math/Calc I Credit Hours: 4
Elective Credit Hours: 3
Elective Credit Hours: 3
Total: 16 Credit Hours

Spring
ACC 203 - Prin of Managerial Acct Credit Hours: 4
BUS 356 - Business Presentations Credit Hours: 4
BUS 456 - Business Research Methods Credit Hours: 3
SPE 321 - Small Group/Team Comm Credit Hours: 3
Total: 14 Credit Hours

Junior Year Fall
ACC 325 - Finance Credit Hours: 4
BUS 457 - Business Research Methods II Credit Hours: 3
MGT 321 - Operations Management I Credit Hours: 3
MGT 461 - Lean/Six Sigma Management I Credit Hours: 3
Elective Credit Hours: 3
Total: 16 Credit Hours

Winter
MGT 322 - Operations Management II Credit Hours: 3
MGT 462 - Lean/Six Sigma Management II Credit Hours: 3
WRI 327 - Advanced Tech Writing Credit Hours: 3
BUS 349 - Human Resource Management I Credit Hours: 3
Elective Credit Hours: 3
Total: 15 Credit Hours

Spring
MGT 323 - Operations Management III Credit Hours: 3
MGT 335 - Project Management Credit Hours: 3
MGT 463 - Lean/Six Sigma Management III Credit Hours: 3
MIS 375 - Decision Support Systems Credit Hours: 3
Elective Credit Hours: 3
Total: 15 Credit Hours

Senior Year Fall
BUS 441 - Leadership I Credit Hours: 3
BUS 467 - Service Management Credit Hours: 3
BUS 495 - Senior Project Proposal Credit Hours: 1
MGT 421 - Quality Management Credit Hours: 3
Laboratory Science Elective Credit Hours: 4
Total: 16 Credit Hours

Winter
ANTH 452 - Globalization Credit Hours: 3
or
PSCI 326 - World Politics in Transition Credit Hours: 3

BUS 496 - Senior Project Credit Hours: 2
MGT 422 - Materials Management Credit Hours: 3
PHIL 331 - Ethics in the Professions Credit Hours: 3
PSY 347 - Organizational Behavior Credit Hours: 3
Total: 15 Credit Hours

Spring
BUS 478 - Strategic Management Credit Hours: 3
BUS 497 - Senior Project Credit Hours: 3
MGT 423 - Logistics Management Credit Hours: 3
Elective Credit Hours: 3
Elective Credit Hours: 3
Total: 15 Credit Hours

Total for a B.S. in Operations Management: 180 Credit Hours

Technology and Management, BAS

The Bachelor of Applied Science (BAS) in Technology and Management provides a path to a bachelor's degree for those students who have completed a technical Associate of Applied Science (AAS) or Associate of Science (AS) degree from an accredited institution recognized by the Council for Higher Education (CHEA) and are seeking career advancement into management or in their technical career fields. The BAS builds on a core of 60 credits of career and technical education (CTE) courses taken as part of the AAS or AS degree, adding 65 credits of business, management, and information technology courses and 55 credits of broad-based general education courses to enable the BAS graduate to advance in the workplace or continue on to graduate school. The management core includes a three-term capstone senior project to enable the student to demonstrate successful integration of technical and managerial coursework.

Curriculum

Required courses and recommended terms during which they should be taken:

Prior Learning
Up to 60 Career Technical Elective credits

Sophomore Year Winter
ACC 201 - Prin of Accounting I Credit Hours: 4

BUS 215 - Principles of Management Credit Hours: 3
or
BUS 304 - Engineering Management Credit Hours: 3
or
BUS 317 - Health Care Management Credit Hours: 3

BUS 226 - Business Law Credit Hours: 3
MATH 111 - College Algebra Credit Hours: 4
WRI 121 - English Composition Credit Hours: 3
Total: 17 Credit Hours

Spring
ACC 203 - Prin of Managerial Acct Credit Hours: 4
ECO 201 - Principles of Microeconomics Credit Hours: 3
MATH 361 - Statistical Methods I Credit Hours: 4
SPE 111 - Public Speaking Credit Hours: 3
WRI 122 - Argumentative Writing Credit Hours: 3
Total: 17 Credit Hours

Junior Year Fall
BUS 457 - Business Research Methods II Credit Hours: 3
MGT 321 - Operations Management I Credit Hours: 3
MGT 461 - Lean/Six Sigma Management I Credit Hours: 3
WRI 227 - Technical Report Writing Credit Hours: 3
Total: 12 Credit Hours

Winter
ACC 325 - Finance Credit Hours: 4
BUS 349 - Human Resource Management I Credit Hours: 3
ECO 202 - Principles of Macroeconomics Credit Hours: 3
MIS 102 - Spreadsheet Software Lab Credit Hours: 1

PHIL 331 - Ethics in the Professions Credit Hours: 3
or
PHIL 342 - Business Ethics Credit Hours: 3 (upper-division) [a]
Total: 14 Credit Hours

Spring
BUS 356 - Business Presentations Credit Hours: 4
MGT 335 - Project Management Credit Hours: 3
MIS 206 - Intro to Mgmt Info Sys Credit Hours: 3
Laboratory Science Elective Credit Hours: 4
Total: 14 Credit Hours

Senior Year Fall
BUS 223 - Marketing I Credit Hours: 3
BUS 441 - Leadership I Credit Hours: 3
BUS 467 - Service Management Credit Hours: 3
BUS 495 - Senior Project Proposal Credit Hours: 1
SPE 321 - Small Group/Team Comm Credit Hours: 3
Total: 15 Credit Hours

Winter
ANTH 452 - Globalization Credit Hours: 3
or
HIST 452 - Globalization & Pac NW Credit Hours: 3

BUS 496 - Senior Project Credit Hours: 2
PSY 347 - Organizational Behavior Credit Hours: 3
Humanities Elective Credit Hours: 3
Math/Science Elective Credit Hours: 4
Total: 16 Credit Hours

Spring
BUS 478 - Strategic Management Credit Hours: 3
BUS 497 - Senior Project Credit Hours: 3

MIS 113 - Intro to Database Systems Credit Hours: 3
or
MIS 275 - Intro to Relational Databases Credit Hours: 4

WRI 327 - Advanced Tech Writing Credit Hours: 3
Humanities Elective Credit Hours: 3
Total: 15/16 Credit Hours

Total for a B.A.S. in Technology and Management: 180/181 Credit Hours

Note: The BAS degree specifies 60 upper-division credits. Students transferring in lower-division course equivalents do not receive upper-division credit and may be required to take upper-division electives to meet the minimum 60 credits of upper division credits required for the BAS degree.

Business Minor

The Minor in Business recognizes the achievement of 21 to 24 credits in business and other courses related to the student's chosen profession. Some of the courses may be included in the student's requirements for a bachelor's degree from Oregon Tech. The Minor in Business may prove valuable to a technical or healthcare student who ventures into management or consulting in his or her career field. It may enhance employability and improve graduate school possibilities. This minor is open to all majors except Business, Health Care Management, Operations Management, and Technology and Management.

Requirements of Minor:
ACC 201 - Prin of Accounting I Credit Hours: 4

BUS 215 - Principles of Management Credit Hours: 3
or
BUS 304 - Engineering Management Credit Hours: 3
or
BUS 317 - Health Care Management Credit Hours: 3

BUS 223 - Marketing I Credit Hours: 3
or
BUS 337 - Princ of Health Care Marketing Credit Hours: 3

BUS 226 - Business Law Credit Hours: 3
PSY 347 - Organizational Behavior Credit Hours: 3

Elective Courses:
BUS 313 - Health Care Systems & Policy Credit Hours: 3
BUS 314 - Entrepreneurship I Credit Hours: 3
BUS 318 - Marketing II Credit Hours: 3
BUS 349 - Human Resource Management I Credit Hours: 3
BUS 356 - Business Presentations Credit Hours: 4
BUS 441 - Leadership I Credit Hours: 3
DH 465 - Dental Hygiene Entrepreneurship Credit Hours: 3
MGT 321 - Operations Management I Credit Hours: 3
MGT 335 - Project Management Credit Hours: 3
MIS 311 - Intro to Systems Analysis Credit Hours: 3

SOC 305 - Rural Health Credit Hours: 3
or
SOC 335 - Hlth Inequal & Cult Competency Credit Hours: 3

PSY 410 - Organiz Change/Develop Credit Hours: 3

Note: A passing grade and a cumulative GPA of 2.0 or better in the business minor courses is required. Students are encouraged to consult with a Management Department advisor to select business courses that would be most applicable to their major and/or career goals.

Health Informatics Minor

The Minor in Health Informatics may prove valuable to allied health students who will likely be expected to interact with technology in their profession. The minor exposes students to the database systems, health information systems, management processes and data used to improve efficiencies and patient care.

Requirements of Minor
BUS 313 - Health Care Systems and Policy Credit Hours: 3
BUS 317 - Health Care Management Credit Hours: 3
MIS 255 - Health Informatics Concepts and Practices Credit Hours: 3
MIS 275 - Introduction to Relational Databases Credit Hours: 4
MIS 345 - Health Care Information Systems Management Credit Hours: 3
MIS 357 - Information and Communication Systems in Health Care Credit Hours: 3

Note: Not all courses are offered every year or on every campus. Additional prerequisites may be required; see catalog descriptions and recent course schedules for details.

Information Technology Minor

The Information Technology (IT) Minor recognizes the achievement of 27 credits in technical courses. Some of the courses may be included in the student's requirements for a bachelor's degree from Oregon Tech. The IT minor may prove valuable to management or technical students who want to demonstrate that they have additional skills in management information systems and information technology areas; enhancing employability and improving graduate school possibilities. The minor is open to all majors except Information Technology, Cybersecurity, and Health Informatics.

Requirements of Minor:
MIS 118 - Intro to Programming in C# Credit Hours: 4
MIS 145 - Intro to PC Hardware/Software Credit Hours: 4
MIS 275 - Intro to Relational Databases Credit Hours: 4
MIS 311 - Intro to Systems Analysis Credit Hours: 3

MIS 312 - Systems Analysis I Credit Hours: 4

Elective Courses:
Choose two electives (8 credits) from the following list:
MIS 218 - Intermediate Programming in C# Credit Hours: 4
MIS 251 - Networking I Credit Hours: 4
MIS 273 - Systems Administration I Credit Hours: 4
MIS 334 - Business Analytics Credit Hours: 4
MIS 341 - Relational Database Design I Credit Hours: 4

Innovation & Entrepreneurship Minor

The minor in Innovation & Entrepreneurship (I&E) is designed to equip students with the skills needed to work in or with innovative organizations, presenting innovation and entrepreneurship as an iterative process that originates with ideation and integrates business evaluation of concepts intended to either solve a problem or bring about desired change. Focus is on the entrepreneurial mindset.

The I&E minor may be completed by students from any major and is especially recommended for students interested in innovation- and invention-based career paths and/or competing in Catalyze Klamath. The minor will give students the opportunity to design a program of study that is relevant to their major program and their future career goals.

Requirements of Minor:
The minor requires 24 credit hours, including three (3) required courses (9 credits). The remaining courses may be chosen, in consultation with their advisor, from the list below.

BUS 314 - Entrepreneurship I Credit Hours: 3
BUS 335 - Entrepreneurship II Credit Hours: 3

ENGR 445 - Engineering Project Management Credit Hours: 3
or
MGT 335 - Project Management Credit Hours: 3
or
PWR 355 - Project Management for Writers Credit Hours: 3

Elective Credit Hours:
ART 315 - Design Thinking Credit Hours: 3
BUS 318 - Marketing II Credit Hours: 3
BUS 319 - Integrated Marketing Comm. Credit Hours: 3
BUS 435 - Marketing III Credit Hours: 3
BUS 441 - Leadership I Credit Hours: 3
COM 215 - Creativity in Comm Credit Hours: 3
COM 309 - Communication Tech in Use Credit Hours: 3
COM 347 - Negotiation & Conflict Resol'n Credit Hours: 3
COM 446 - Communication & Leadership Credit Hours: 3
PSY 347 - Organizational Behavior Credit Hours: 3
PWR 330 - User Research Credit Hours: 3
SPE 321 - Small Group/Team Comm Credit Hours: 3
WRI 350 - Documentation Develop Credit Hours: 3

Note: Additional prerequisites may be required. Students are encouraged to work with their advisor to identify those courses most relevant to their course of study.

International Business Minor

The Minor in International Business recognizes the achievement of 22 credits in international courses. The Minor in International Business may prove valuable to a technical student who ventures into management or consulting in his or her career field; enhancing employability and improving graduate school possibilities. This minor is open to all majors and is especially recommended for students with an interest in Business and/or global affairs.

Requirements of Minor:
A passing grade in all courses and a cumulative GPA of 2.0 or better is required to be awarded the minor. Students are encouraged to consult with a Management Department advisor to schedule courses.

BUS 308 - Prin of International Business Credit Hours: 3

BUS 387 - International Human Res Mgmt Credit Hours: 3
or
PSCI 326 - World Politics in Transition Credit Hours: 3
or
PSCI 497 - US Foreign Policy Credit Hours: 3

BUS 434 - Global Marketing Credit Hours: 3
COM 205 - Intercultural Comm Credit Hours: 3
ECO 367 - Int'l Economics & Finance Mgt Credit Hours: 4
MIS 311 - Intro to Systems Analysis Credit Hours: 3

PSCI 250 - Intro to World Politics Credit Hours: 3
Suggested Social Science Electives
GEOG 106 - Cultural Geography I Credit Hours: 3
HIST 103 - Hist-Western Civil Credit Hours: 3
PSCI 326 - World Politics in Transition Credit Hours: 3
PSCI 497 - US Foreign Policy Credit Hours: 3

Suggested Open Electives
COM 320 - Advanced Intercultural Comm Credit Hours: 3
Any foreign language sequence Credit Hours: 4

Suggested Humanities Electives
Any second year foreign language sequence Credit Hours: 4

Strongly Recommended: Study Abroad Program
1 semester/2 terms Credit Hours: 4

Accounting Post Baccalaureate Certificate

This certificate is available to students who have a baccalaureate degree and are continuing their education in accounting. Completion of the certificate will allow students to meet the requirements for admission to the Certified Public Accountant (CPA) exam and prepare them for a variety of career paths including CPA and Certified Management Accountant (CMA).

Required Courses (32 credits)

ACC 320 Cost Accounting I Credit Hours: 4
ACC 331 Interm Accounting I Credit Hours: 4
ACC 332 Interm Accounting II Credit Hours: 4
ACC 333 Interm Accounting III Credit Hours: 4
ACC 405 Accounting Info Sys Credit Hours: 4
ACC 411 Income Tax Procedures Credit Hours: 4
ACC 431 Advanced Accounting I Credit Hours: 4
ACC 435 Auditing Credit Hours: 4

Elective Courses

(Choose at least 15 credits from the following courses)
ACC 321 Cost Accounting II Credit Hours: 4
ACC 325 Finance Credit Hours: 4
ACC 412 Corporate Taxation Credit Hours: 4
ACC 432 Advanced Accounting II Credit Hours: 4
ACC 465 Case Studies in Accounting Credit Hours: 4
BUS 226 Business Law Credit Hours: 3
BUS 345 Fraud Examination Credit Hours: 3
MIS 312 Systems Analysis I Credit Hours: 4

Note: At least 36 credits must be taken at Oregon Tech

Six Sigma Green Belt Emphasis

The Management Department offers students the opportunity to earn a Six Sigma Green Belt Certificate. The Green Belt Certificate is an emphasis under the BS in Business, Management and Marketing options, the BS in Health Care Management, Administration option, and the BS in Operations Management. In addition to the fundamental management curriculum, the emphasis requires the completion of a Lean/Six Sigma project. Those attaining the emphasis will be well-positioned to work in companies that deploy Lean Six Sigma.

Additionally, employees of companies that deploy Lean Six Sigma may complete the course work and project to obtain their certificate.
Students completing the Six Sigma Green Belt Emphasis must complete the following courses and their prerequisites. Prerequisites may be waived for industry students depending on their individual backgrounds and abilities.

Courses

BUS 457 - Business Research Methods II Credit Hours: 3
BUS 496 - Senior Project Credit Hours: 2
BUS 497 - Senior Project Credit Hours: 3
MGT 335 - Project Management Credit Hours: 3
MGT 461 - Lean/Six Sigma Management I Credit Hours: 3
MGT 462 - Lean/Six Sigma Management II Credit Hours: 3
MGT 463 - Lean/Six Sigma Management III Credit Hours: 3

Note: It should be noted that for OM majors, all of these courses are currently in the curriculum map. No additional coursework is required. With approval, the student's senior project may also be considered for the Six Sigma Green Belt Certificate.

Renewable Energy Management Emphasis

The Management Department offers students the opportunity to complete a Renewable Energy Management emphasis under the BS in Business, Management option or the BS in Operations Management. In addition to the fundamental management curriculum, the emphasis requires additional coursework in chemistry, management information systems, humanities, history, and economics. Those attaining the emphasis will be prepared to successfully integrate skills in the social, environmental, economic, business and management aspects of energy management.

Requirement of Emphasis

CHE 201 - General Chemistry I Credit Hours: 3
CHE 204 - General Chemistry I Lab Credit Hours: 1
or
PHY 201 - General Physics Credit Hours: 4

ECO 357 - Energy Economics & Policy Credit Hours: 3
HIST 356 - A History of Energy Credit Hours: 3
HUM 125 - Intro Tech, Soc, Value Credit Hours: 3
MATH 112 - Trigonometry Credit Hours: 4
MIS 115 - Visual BASIC Programming Credit Hours: 4
MGT 212 - Fund of Renewable Energy Mgt Credit Hours: 3
REE 201 - Intro to Renewable Energy Credit Hours: 3

Manufacturing and Mechanical Engineering and Technology Department

Brian Moravec, *Interim Department Chair*
Robert Paxton, *Program Director, Mechanical Engineering*
Steve Edgeman, *Program Director, Undergraduate Manufacturing Engineering Technology & Mechanical Engineering Technology*
Steve Addison, *Program Director, Graduate Manufacturing Engineering Technology*
Wangping Sun, *Site Director, Portland-Metro Campus*
Steve Addison, *Site Director, Seattle Campus*
Professors: D. Culler, N. Mead, B. Moravec, R. Shih, W. Sun
Associate Professors: W. Abrous, S. Addison, I. Demeshko-Prosnik, Y. Gao, D. Lee, M. Meyers, R. Paxton, M. Saber, S. Sloan, C. Stover
Assistant Professors: S. Edgeman

Degrees Offered

- Master of Science in Manufacturing Engineering Technology
- Bachelor of Science in Manufacturing Engineering Technology
- Bachelor of Science in Mechanical Engineering
- Bachelor of Science in Mechanical Engineering Technology

Manufacturing Engineering Technology

Degrees Offered

- Master of Science in Manufacturing Engineering Technology
- Bachelor of Science in Manufacturing Engineering Technology

Program Mission Statement

The Manufacturing Engineering Technology Program at Oregon Institute of Technology is an applied engineering technology program. Its mission is to provide graduates with the skills and knowledge for successful careers in Manufacturing Engineering Technology.

Program Educational Objectives

Program educational objectives are broad statements that describe the career and professional accomplishments that the program is preparing graduates to achieve. The Program Educational Objectives of Oregon Tech's Manufacturing Engineering Technology Program are to produce graduates who:

- are able to analyze, design, implement, and maintain practical mechanical and manufacturing systems
- communicate effectively and work well on team-based engineering projects
- succeed in manufacturing and mechanical engineering technology positions
- pursue continued professional development

Career Opportunities

Manufacturing Engineering graduates will find a wide range of opportunities for employment in manufacturing design, research and development, testing, educational institutions, consulting and business. Manufacturing Engineering Technology also prepares students for further study in graduate school. In today's engineering environment, manufacturing engineers are often called upon to perform a wide range of tasks, from designing and purchasing manufacturing equipment to improving and troubleshooting the manufacturing process. Manufacturing engineers are involved in the design and continuous improvement of products, manufacturing equipment and production tooling. The Manufacturing Engineering curriculum provides education in a variety of areas including manufacturing process, robotics and automation, industrial controls, manufacturing tool design, computer aided design and manufacturing, engineering materials, manufacturing planning and quality control. Technical Electives allow the student flexibility in developing technical breadth or focus in their areas of interest.

Bachelor Program Objectives

The objective of the Manufacturing Engineering Technology undergraduate program is to offer the student a quality education that provides the greatest possible opportunity for rewarding and successful careers. This includes practical training and technical education in engineering, manufacturing processes, and manufacturing equipment as well as supplemental coursework in communications, mathematics, science, social science, and business.

Master Program Objectives

The objective of the graduate program in Manufacturing Engineering Technology is to offer students an advanced level of education that will help them to be successful in their professional career. This includes the theoretical and practical training in manufacturing systems, design for manufacturability, development of lean enterprise, quality engineering, computer-aided manufacturing, project management and information systems. The master's degree is also available online to students meeting the admission requirements for the program. There are no residency requirements for this degree. The same degree requirements apply to the online program.

Student Preparation

Students planning to enter the Manufacturing Engineering Technology Program are strongly encouraged to take mathematics and science training in high school. In addition, courses such as drafting, CAD, computer skills, and industrial arts will prove beneficial.

Note: The Portland-Metro campus is a laptop-required campus with resources like laptop specifications, financial aid, and helpful instructions found at http://www.oit.edu/portland-metro/college-costs/bring-your-own-device.

Cooperative Education Program

Students in the Bachelor of Science degree program have an opportunity to work in industry for a specified time and receive college credit. They are encouraged to meet with the Manufacturing Engineering Technology Undergraduate Program Director. MFG students at both the Klamath Falls and

Portland-Metro campuses have the opportunity to participate in the state-wide MECOP internship program. For information, see the following Web site: https://mecopinc.org.

Accreditation
The Bachelor of Science in Manufacturing Engineering Technology is accredited by the Engineering Technology Accreditation Commission (ETAC) of ABET, Inc., http://www.abet.org. ABET is a specialized accrediting board recognized by the Council for Higher Education and/or the Secretary of the U.S. Department of Education.

Mechanical Engineering
Degree Offered
- Bachelor of Science in Mechanical Engineering

Program Mission Statement
The Mechanical Engineering Program at Oregon Institute of Technology is an applied engineering program. Its mission is to provide graduates the skills and knowledge for successful careers in mechanical engineering.

Program Educational Objectives
Program educational objectives are broad statements that describe the career and professional accomplishments that the program is preparing alumni to achieve.

The program expects graduates to achieve, within several years of graduation, the following objectives. Mechanical Engineering graduates will have:
- demonstrated the ability to analyze, design and improve practical thermal and/or mechanical systems
- shown the ability to communicate effectively and work well on team-based engineering projects
- succeeded in entry-level mechanical engineering positions regionally and nationally
- pursued continued professional development, including professional registration, if desired
- successfully pursued engineering graduate studies and research, if desired
-

Career Opportunities
Mechanical Engineering is the broadest branch of engineering providing graduates the ability to pursue many varied career paths. It encompasses a wide variety of specialties including alternative energy, mechanical design, thermal/fluids/heat transfer, and mechatronics to name a few. Graduates will find a wide range of opportunities for employment in design, research and development, testing, manufacturing, government agencies, educational institutions, consulting and business. The Mechanical Engineering degree also prepares the student for further study in graduate school.

Objectives of the Program
The Mechanical Engineering Program at Oregon Institute of Technology provides an excellent theoretical and applied or hands on engineering education. The program provides graduates with a foundation in fundamentals, applications, design, project management, communications, and professional and ethical responsibility.

The program offers coursework in all of the above areas beginning with mathematics, science, machining, welding, and computer aided design topics in the freshman year. Engineering science and physics courses are typically taken by the student in the sophomore year. Junior and senior curriculum is devoted to analysis, design, and testing aspects of mechanical engineering. Technical electives are available for students to pursue their particular fields of interest.

Throughout the four-year curriculum, emphasis is placed on oral and written communication skills, teamwork and cooperation, and hands on laboratory and project work. Graduates are well-rounded engineers and readily accepted into industry or graduate programs.

Student Preparation
Students planning to enter the Mechanical Engineering curriculum should undertake Mathematics/science training in high school. Such courses as algebra, trigonometry, calculus, physics, chemistry, drafting, CAD, writing, speech, and shop classes will prove beneficial.

Note: The Portland-Metro campus is a laptop-required campus with resources like laptop specifications, financial aid, and helpful instructions found at http://www.oit.edu/portland-metro/college-costs/bring-your-own-device.

Cooperative Field Experience
There is an opportunity for students in the Bachelor of Science degree program to work in industry for a specified time and receive college credit. Those interested in such an opportunity are encouraged to work out the details with the Mechanical Engineering Program Director. Mechanical Engineering students at the Klamath Falls Campus have the opportunity to participate in the state-wide MECOP internship program. For information, see the following Web site: https://mecopinc.org.

Accreditation
The Mechanical Engineering Program is accredited by the Engineering Accreditation Commission (EAC) of ABET, Inc., http://www.abet.org. ABET is a specialized accrediting board recognized by the Council for Higher Education and/or the Secretary of the U.S. Department of Education.

Mechanical Engineering Technology
Degree Offered
- Bachelor of Science in Mechanical Engineering Technology

Program Mission Statement

The Mechanical Engineering Technology Program at Oregon Institute of Technology is an applied engineering technology program. Its mission is to provide graduates with the skills and knowledge for successful careers in mechanical engineering and manufacturing engineering.

Program Educational Objectives

Program educational objectives are broad statements that describe the career and professional accomplishments that the program is preparing graduates to achieve. The Program Educational Objectives of Oregon Tech's Mechanical Engineering Technology Program are to produce graduates who:

- are able to analyze, design, implement, and maintain practical mechanical systems
- communicate effectively and work well on team-based engineering projects
- succeed in mechanical and manufacturing engineering positions
- pursue continued professional development

Career Opportunities

Mechanical Engineering Technology graduates find a wide range of opportunities for employment in design, research and development, testing, manufacturing, government agencies, educational institutions, consulting and business. The largest number of graduates are employed by manufacturing firms. There, the graduates may develop new products, improve existing products, modify existing products for easier manufacture, or develop equipment for use in the production process. The work done by Mechanical Engineering Technologists varies widely. Interfacing computers and machines is a rapidly growing area of employment. This involvement with robotics and automation is having an impact on most mechanical systems. New materials such as high strength ceramics and polymers, fiber reinforced plastics, and new bonding agents are growing in importance and their applications will offer many interesting and fulfilling careers. Energy systems become increasingly important as energy costs rise. Aerospace firms employ many Oregon Tech graduates in design, testing, and manufacturing. Careers in such traditional areas as power plants, heating and cooling systems, gas and steam turbines, and automotive systems are within the domain for the Mechanical Engineering Technologist.

Objectives of the Program

The objective of the Mechanical Engineering Technology Program is to ensure that graduates of this curriculum acquire competency in those theoretical, applied engineering and practical subjects necessary to become successful in their careers. The program strives to maintain a reputation for academic standards that will assure graduates a welcome by prospective employers.

Student Preparation

Students planning to enter the Mechanical Engineering Technology curriculum should undertake mathematics-science training in high school. Such courses as algebra, geometry, trigonometry, physics, chemistry, drafting, CAD, English, writing, speech, and shop classes will prove beneficial.

Note: The Portland-Metro campus is a laptop-required campus with resources like laptop specifications, financial aid, and helpful instructions found at http://www.oit.edu/portland-metro/college-costs/bring-your-own-device.

Cooperative Field Experience

There is an opportunity for students in the Bachelor of Science degree program to work in industry for a specified time and receive college credit. Those interested in such an opportunity are encouraged to work out the details with the Mechanical Engineering Technology program director. MET students at both the Klamath Falls and the Portland-Metro campuses have the opportunity to participate in the state-wide MECOP internship program. For information, see the following Web site: https://mecopinc.org.

Accreditation

The Mechanical Engineering Technology Program is accredited by the Engineering Technology Accreditation Commission (ETAC) of ABET, Inc., http://www.abet.org. ABET is a specialized accrediting board recognized by the Council for Higher Education and/ or the Secretary of the U.S. Department of Education.

Manufacturing Engineering Technology, BS

Degree Requirements

The Bachelor of Science in Manufacturing Engineering Technology requires completing 192 credit hours, as prescribed in the following curriculum outline. Several of these courses are titled manufacturing elective, and allow the student some flexibility to pursue specific career objectives within the manufacturing engineering field. Upper-division manufacturing engineering technology courses not specifically required for graduation, as well as selected upper-division mechanical engineering technology courses and other approved courses, may be used as manufacturing electives. Students should contact their advisor for specific details as to which courses qualify as manufacturing electives.

Engineering Science Elective

In order to satisfy the engineering science elective, the student must complete one of the following courses:
ENGR 212 - Engineering Mech: Dynamics Credit Hours: 3
ENGR 355 - Thermodynamics Credit Hours: 3
MECH 318 - Fluid Mechanics Credit Hours: 4

Curriculum

Required courses and recommended terms during which they should be taken:

Freshman Year Fall
ENGR 111 - MMET Orientation Credit Hours: 2
MATH 111 - College Algebra Credit Hours: 4
WRI 121 - English Composition Credit Hours: 3
Humanities/Social Science Elective Credit Hours: 3 [a]
Humanities/Social Science Elective Credit Hours: 3 [a]
Introduction to General Chemistry [b]
Introduction to General Chemistry Laboratory [b]
Total: 15 Credit Hours

Winter
CHE 201 - General Chemistry I Credit Hours: 3
CHE 204 - General Chemistry I Lab Credit Hours: 1
MATH 112 - Trigonometry Credit Hours: 4
MET 241 - CAD for Mechanical Design I Credit Hours: 2
MFG 120 - Intro Machining Proc Credit Hours: 4
WRI 122 - Argumentative Writing Credit Hours: 3
Total: 17 Credit Hours

Spring
MATH 251 - Differential Calculus Credit Hours: 4
MET 242 - CAD for Mechanical Design II Credit Hours: 2
MFG 103 - Intro Welding Proc Credit Hours: 3
SPE 111 - Public Speaking Credit Hours: 3
Humanities/Social Science Elective Credit Hours: 3 [a]
Total: 15 Credit Hours

Sophomore Year Fall
MATH 252 - Integral Calculus Credit Hours: 4
MECH 260 - Engineering Materials I Credit Hours: 3
MFG 314 - Geom Dimension/Tolerance Credit Hours: 3
PHY 221 - General Physics w/Calculus Credit Hours: 4
Humanities/Social Science Elective Credit Hours: 3 [a]
Total: 17 Credit Hours

Winter
ENGR 211 - Engineering Mechanics: Statics Credit Hours: 4 [c]
MATH 361 - Statistical Methods I Credit Hours: 4
MFG 112 - Intro to Mfg Processes Credit Hours: 3
PHY 222 - General Physics w/Calculus Credit Hours: 4
Total: 15 Credit Hours

Spring
ENGR 213 - Engr Mech: Strength of Mat Credit Hours: 4 [c]
ENGR 236 - Fund of Elec Circuits Credit Hours: 3
ENGR 266 - Engineering Computation Credit Hours: 3
MATH 362 - Statistical Methods II Credit Hours: 4
WRI 227 - Technical Report Writing Credit Hours: 3
Total: 17 Credit Hours

Junior Year Fall
ENGR 326 - Electric Power Systems Credit Hours: 3
MECH 315 - Machine Design I Credit Hours: 3
MECH 360 - Engineering Materials II Credit Hours: 3
MET 375 - Solid Modeling Credit Hours: 3
MFG 313 - Mfg Analysis & Planning Credit Hours: 3
MFG 341 - Numerical Control Prog Credit Hours: 3
Total: 18 Credit Hours

Winter
MECH 316 - Machine Design II Credit Hours: 3
MECH 363 - Engineering Instrumentation Credit Hours: 3
MFG 333 - Stat Methods Qual/Improv Credit Hours: 3
MFG 342 - Computer Aided Machining Credit Hours: 3
MFG 343 - Manufacturing Tool Dsgn Credit Hours: 3
Total: 15 Credit Hours

Spring
MFG 331 - Industrial Controls Credit Hours: 3
MFG 344 - Dsgn of Mfg Tooling Credit Hours: 3
SPE 321 - Small Group/Team Comm Credit Hours: 3
Engineering Science Elective Credit Hours: 3 [d]
Project Management Requirement Credit Hours: 3 [e]
Total: 15 Credit Hours

Senior Year Fall
ANTH 452 - Globalization Credit Hours: 3
ENGR 491 - MMET Senior Projects I Credit Hours: 3
MFG 453 - Automation & Robotics Credit Hours: 3
MFG 454 - Thermal Manufacturing Process Credit Hours: 3
WRI 327 - Advanced Tech Writing Credit Hours: 3
MFG Elective Credit Hours: 3 [f]
Total: 18 Credit Hours

Winter
ENGR 492 - MMET Senior Projects II Credit Hours: 3
MGT 345 - Engineering Economy Credit Hours: 3
Humanities Elective Credit Hours: 3
MFG Elective Credit Hours: 3 [f]
MFG Elective Credit Hours: 3 [f]
Total: 15 Credit Hours

Spring
ENGR 415 - Occupational Safety Credit Hours: 3
ENGR 493 - MMET Senior Projects III Credit Hours: 3
MECH 426 - Fluid Power Systems Credit Hours: 3
MFG 447 - Lean Manufacturing Credit Hours: 3
Humanities/Social Science Elective Credit Hours: 3 [a]
Total: 15 Credit Hours

Total for a B.S. in Manufacturing Engineering Technology: 192 Credit Hours

[a] Select 9 credits of Humanities electives and 9 credits of Social Science electives. ANTH 452 fulfills the remaining credits needed to satisfy the 12 credits of Social Science courses for the Baccalaureate general education requirements

[b] CHE 101 and CHE 104 should be taken if needed to adequately prepare for CHE 201 and CHE 204. Any credits earned from these courses (CHE101/104) do not apply to the degree program. Consult with an academic advisor for further guidance
[c] MECH 221, MECH 222, MECH 223 may be alternatively taken (as an entire sequence) to satisfy the ENGR 211 and ENGR 213 requirements
[d] Select **one** course from the following list: ENGR 212, ENGR 355, or MECH 318
[e] Select either ENGR 445 or MGT 335
[f] Consult with an academic advisor or program director regarding available and appropriate MFG elective courses. Certain ENGR, MECH, and MET upper-division courses not already required for the program are also acceptable

Manufacturing Engineering Technology, MS

Degree Requirements

The Master of Science in Manufacturing Engineering Technology requires completing 45 credit hours of graduate work, with at least 30 credit hours of graduate coursework from the following four Curriculum Content Areas (CCAs):

1. Engineering Science and Design Technology
2. Manufacturing Software and Computer Integration
3. Advanced Manufacturing Materials and Processes Technology
4. Business, Financial and Management Processes

In addition to the 30 CCA credit hours, students must complete 12 credits toward thesis or 9 credits toward an approved project and three credits in graduate seminars. Students must take at least one course in each of the four CCAs and three courses in at least one CCA. All graduate courses are three credits each. See Master's student advisor to complete an academic plan.

Manufacturing Engineering Technology/Mechanical Engineering Technology, BS

Concurrent Degree

The Mechanical and Manufacturing Engineering Technology Department provides the opportunity for the interested student to earn concurrent degrees in Manufacturing Engineering Technology (MFG) and Mechanical Engineering Technology (MET) or Mechanical Engineering (MECH). Students who earn both degrees are highly sought after and have been very successful in industry. The concurrent degree program usually requires the student to complete an additional year of study beyond the Bachelor's Degree in Mechanical Engineering or Mechanical Engineering Technology.

Fall
MFG 313 - Mfg Analysis & Planning Credit Hours: 3
MFG 341 - Numerical Control Prog Credit Hours: 3
MFG 453 - Automation & Robotics Credit Hours: 3
BUS/MGT Restricted Elective Credit Hours 3 [a]
Manufacturing Elective Credit Hours: 3 [b]
Total: 15 Credit Hours

Spring
ENGR 415 - Occupational Safety Credit Hours: 3
MFG 331 - Industrial Controls Credit Hours: 3 [c]
MFG 344 - Dsgn of Mfg Tooling Credit Hours: 3
MFG 447 - Lean Manufacturing Credit Hours: 3
Manufacturing Elective Credit Hours: 3 [b]
Total: 15 Credit Hours

Winter
MFG 112 - Intro to Mfg Processes Credit Hours: 3 [c]
MFG 333 - Stat Methods Qual/Improv Credit Hours: 3
MFG 342 - Computer Aided Machining Credit Hours: 3
MFG 343 - Manufacturing Tool Dsgn Credit Hours: 3
MATH 362 - Statistical Methods II Credit Hours: 4
Total: 16 Credit Hours

[a] Restricted Elective from the following courses: BUS 226, BUS 304, BUS 335, MGT 321, MGT 461 or MGT 462
[b] These courses must be different than those used to satisfy the BS degree in MET or MECH. In all cases the student must have at least 36 credits of additional coursework beyond the MET or MECH degree to qualify for the concurrent degree in MFG
[c] This course is already required for the BSMET degree

Manufacturing Engineering Technology/Mechanical Engineering, BS

Concurrent Degree

The Mechanical and Manufacturing Engineering Technology Department provides the opportunity for the interested student to earn concurrent degrees in Manufacturing Engineering Technology (MFG) and Mechanical Engineering Technology (MET) or Mechanical Engineering (MECH). Students who earn both degrees are highly sought after and have been very successful in industry. The concurrent degree program usually requires the student to complete an additional year of study beyond the Bachelor's Degree in Mechanical Engineering or Mechanical Engineering Technology.

Fall
MFG **313 - Mfg Analysis & Planning Credit Hours: 3**
MFG 341 - Numerical Control Prog Credit Hours: 3
MFG 453 - Automation & Robotics Credit Hours: 3
BUS/MGT Restricted Elective Credit Hours 3 [a]
Manufacturing Elective Credit Hours: 3 [b]
Total: 15 Credit Hours

Spring
ENGR 415 - Occupational Safety Credit Hours: 3
MFG 344 - Dsgn of Mfg Tooling Credit Hours: 3
MFG 447 - Lean Manufacturing Credit Hours: 3
MFG 331 - Industrial Controls Credit Hours: 3
Manufacturing Elective Credit Hours: 3 [b]
Total: 15 Credit Hours

Winter
MFG 112 - Intro to Mfg Processes Credit Hours: 3 [c]
MFG 333 - Stat Methods Qual/Improv Credit Hours: 3
MFG 342 - Computer Aided Machining Credit Hours: 3
MFG 343 - Manufacturing Tool Dsgn Credit Hours: 3
MATH 362 - Statistical Methods II Credit Hours: 4
Total: 16 Credit Hours

[a] Restricted Elective from the following courses: BUS 226, BUS 304, BUS 335, MGT 321, MGT 461 or MGT 462
[b] These courses must be different than those used to satisfy the BS degree in MET or MECH. In all cases the student must have at least 36 credits of additional coursework beyond the MET or MECH degree to qualify for the concurrent degree in MFG
[c] This course is already required for the BSMET degree

Mechanical Engineering Technology, BS

Degree Requirements

In the curriculum listings appear several courses titled "MET Elective." MET electives allow the student to select and pursue specific career objectives within the mechanical engineering technology field. MET electives are upper-division MET courses, not specifically required for graduation. Students from other institutions should refer to the sections of this catalog titled "Transfer Students" and "Admission to Baccalaureate Programs." The Bachelor of Science in Mechanical Engineering Technology requires 191 credit hours as prescribed in the following curriculum outline.

Curriculum

Required courses and recommended terms during which they should be taken:

Freshman Year Fall
CHE 201 - General Chemistry I Credit Hours: 3
CHE 204 - General Chemistry I Lab Credit Hours: 1
ENGR 111 - MMET Orientation Credit Hours: 2
MATH 111 - College Algebra Credit Hours: 4
WRI 121 - English Composition Credit Hours: 3
Psychology Elective Credit Hours: 3 [a]
Total: 16 Credit Hours

Winter
MATH 112 - Trigonometry Credit Hours: 4
MFG 120 - Intro Machining Proc Credit Hours: 4
WRI 122 - Argumentative Writing Credit Hours: 3
Humanities Elective Credit Hours: 3
Social Science Elective Credit Hours: 3
Total: 17 Credit Hours

Spring
MATH 251 - Differential Calculus Credit Hours: 4
MFG 103 - Intro Welding Proc Credit Hours: 3
SPE 111 - Public Speaking Credit Hours: 3
Economics Elective Credit Hours: 3
Humanities Elective Credit Hours: 3
Total: 16 Credit Hours

Sophomore Year Fall
MATH 252 - Integral Calculus Credit Hours: 4
MECH 260 - Engineering Materials I Credit Hours: 3
MET 241 - CAD for Mechanical Design I Credit Hours: 2
PHY 221 - General Physics w/Calculus Credit Hours: 4
WRI 227 - Technical Report Writing Credit Hours: 3
Total: 16 Credit Hours

Winter
ENGR 211 - Engineering Mechanics: Statics Credit Hours: 4 [b]
MATH 254 - Vector Calculus I Credit Hours: 4
MET 242 - CAD for Mechanical Design II Credit Hours: 2
MFG 112 - Intro to Mfg Processes Credit Hours: 3
PHY 222 - General Physics w/Calculus Credit Hours: 4
Total: 17 Credit Hours

Spring
ENGR 213 - Engr Mech: Strength of Mat Credit Hours: 4 [b]
ENGR 266 - Engineering Computation Credit Hours: 3
MATH 361 - Statistical Methods I Credit Hours: 4
PHY 223 - General Physics w/Calculus Credit Hours: 4
Total: 15 Credit Hours

Junior Year Fall
ENGR 236 - Fund of Elec Circuits Credit Hours: 3
ENGR 355 - Thermodynamics Credit Hours: 3
MECH 315 - Machine Design I Credit Hours: 3
MECH 360 - Engineering Materials II Credit Hours: 3
MET 375 - Solid Modeling Credit Hours: 3
Total: 15 Credit Hours

Winter
ENGR 212 - Engineering Mech: Dynamics Credit Hours: 3
MECH 318 - Fluid Mechanics Credit Hours: 4
MECH 316 - Machine Design II Credit Hours: 3
MECH 363 - Engineering Instrumentation Credit Hours: 3
SPE 321 - Small Group/Team Comm Credit Hours: 3
Total: 16 Credit Hours

Spring
MATH 321 - Appl Diff Equation I Credit Hours: 4
MECH 313 - Thermodynamics II Credit Hours: 3
MECH 351 - Finite Element Analysis Credit Hours: 3
MFG 314 - Geom Dimension/Tolerance Credit Hours: 3
Project Management Requirement Credit Hours: 3 [c]
Total: 16 Credit Hours

Senior Year Fall
ENGR 326 - Electric Power Systems Credit Hours: 3
ENGR 491 - MMET Senior Projects I Credit Hours: 3
MECH 323 - Heat Transfer I Credit Hours: 3
MGT 345 - Engineering Economy Credit Hours: 3
MET Elective Credit Hours: 3 [d]
Total: 15 Credit Hours

Winter
ENGR 492 - MMET Senior Projects II Credit Hours: 3
MECH 437 - Heat Transfer II Credit Hours: 2
WRI 327 - Advanced Tech Writing Credit Hours: 3
MET Elective Credit Hours: 3 [d]
MET Elective Credit Hours: 3 [d]
Social Science Elective Credit Hours: 3
Total: 17 Credit Hours

Spring
ENGR 493 - MMET Senior Projects III Credit Hours: 3
MECH 426 - Fluid Power Systems Credit Hours: 3
MFG 331 - Industrial Controls Credit Hours: 3
Humanities Elective Credit Hours: 3
MET Elective Credit Hours: 3 [d]
Total: 15 Credit Hours

Total for a B.S. in Mechanical Engineering Technology: 191 Credit Hours

[a] PSY 201 is highly recommended
[b] MECH 221, MECH 222, and MECH 223 may be alternatively taken (as an entire sequence) to satisfy the ENGR 211 and ENGR 213 requirements
[c] Select either ENGR 445 or MGT 335
[d] Consult with an academic advisor or program director regarding available and appropriate MET elective courses. Certain ENGR, MECH and MFG upper-division courses not already required for the program **are also** acceptable

Mechanical Engineering, BS

Degree Requirements

In the curriculum listings appear several courses titled "MECH Elective." MECH electives allow the student to select and pursue specific career objectives within the mechanical engineering field. MECH electives are upper-division MECH courses, not specifically required for graduation. Students from other institutions should refer to the sections of this catalog titled "Transfer Students" and "Admission to Baccalaureate Programs." The Bachelor of Science in Mechanical Engineering requires 192 credit hours as prescribed in the following curriculum outline.

Curriculum

Required courses and recommended terms during which they should be taken:

Freshman Year Fall
CHE 201 - General Chemistry I Credit Hours: 3
CHE 204 - General Chemistry I Lab Credit Hours: 1
ENGR 111 - MMET Orientation Credit Hours: 2
WRI 121 - English Composition Credit Hours: 3
Humanities/Social Science Elective Credit Hours: 3 [a]
College Algebra (if suggested by advisor) [b]
Total: 12 Credit Hours

Winter
CHE 202 - General Chemistry II Credit Hours: 3
CHE 205 - General Chemistry II Lab Credit Hours: 1
MFG 103 - Intro Welding Proc Credit Hours: 3
WRI 122 - Argumentative Writing Credit Hours: 3
Humanities/Social Science Elective Credit Hours: 3 [a]
Trigonometry (if suggested by advisor) [b]
Total: 13 Credit Hours

Spring
MATH 251 - Differential Calculus Credit Hours: 4
MFG 120 - Intro Machining Proc Credit Hours: 4
MET 241 - CAD for Mechanical Design I Credit Hours: 2
SPE 111 - Public Speaking Credit Hours: 3
Economics Elective Credit Hours: 3 [a]
Total: 16 Credit Hours

Sophomore Year Fall
MATH 252 - Integral Calculus Credit Hours: 4
MECH 260 - Engineering Materials I Credit Hours: 3
MET 242 - CAD for Mechanical Design II Credit Hours: 2
PHY 221 - General Physics w/Calculus Credit Hours: 4
WRI 227 - Technical Report Writing Credit Hours: 3
Total: 16 Credit Hours

Winter
ENGR 211 - Engineering Mechanics: Statics Credit Hours: 4 [f]
MATH 254 - Vector Calculus I Credit Hours: 4
MFG 314 - Geom Dimension/Tolerance Credit Hours: 3
PHY 222 - General Physics w/Calculus Credit Hours: 4
Total: 15 Credit Hours

Spring
ENGR 213 - Engr Mech: Strength of Mat Credit Hours: 4 [f]
ENGR 236 - Fund of Elec Circuits Credit Hours: 3
ENGR 266 - Engineering Computation Credit Hours: 3
MATH 321 - Appl Diff Equation I Credit Hours: 4
PHY 223 - General Physics w/Calculus Credit Hours: 4
Total: 18 Credit Hours

Junior Year Fall
MATH 341 - Linear Algebra I Credit Hours: 4
MECH 318 - Fluid Mechanics Credit Hours: 4
MECH 363 - Engineering Instrumentation Credit Hours: 3
MET 375 - Solid Modeling Credit Hours: 3
Statistics Requirement Credit Hours: 4 [c]
Total: 18 Credit Hours

Winter
ENGR 212 - Engineering Mech: Dynamics Credit Hours: 3
ENGR 326 - Electric Power Systems Credit Hours: 3
ENGR 355 - Thermodynamics Credit Hours: 3
MECH 315 - Machine Design I Credit Hours: 3
MECH 360 - Engineering Materials II Credit Hours: 3
SPE 321 - Small Group/Team Comm Credit Hours: 3
Total: 18 Credit Hours

Spring
HUM 125 - Intro Tech, Soc, Value Credit Hours: 3
MATH 451 - Numerical Methods I Credit Hours: 4
MECH 313 - Thermodynamics II Credit Hours: 3
MECH 316 - Machine Design II Credit Hours: 3
MECH Elective Credit Hours: 3 [d]
Total: 16 Credit Hours

Senior Year Fall
ENGR 491 - MMET Senior Projects I Credit Hours: 3
MECH 323 - Heat Transfer I Credit Hours: 3
MECH 351 - Finite Element Analysis Credit Hours: 3
WRI 327 - Advanced Tech Writing Credit Hours: 3
Fluid Mechanics II Requirement Credit Hours: 3 [e]
MECH Elective Credit Hours: 3 [d]
Total: 18 Credit Hours

Winter
ENGR 492 - MMET Senior Projects II Credit Hours: 3
MECH 437 - Heat Transfer II Credit Hours: 2
MECH 480 - Mechanical Vibrations Credit Hours: 3
PHIL 331 - Ethics in the Professions Credit Hours: 3
Humanities/Social Science Elective Credit Hours: 3 [a]
MECH Elective Credit Hours: 3 [d]
Total: 17 Credit Hours

Spring
ENGR 493 - MMET Senior Projects III Credit Hours: 3
MECH 436 - Classical Control Systems Credit Hours: 3
MGT 345 - Engineering Economy Credit Hours: 3
Humanities /Social Science Elective Credit Hours: 3 [a]
MECH Elective Credit Hours: 3 [d]
Total: 15 Credit Hours

Total for a B.S. in Mechanical Engineering: 192 Credit Hours

[a] Along with HUM 125, PHIL 331, and an Economics course, another 3 credits of Humanities courses and 9 credits of Social Science courses. Furthermore, activity or performance-based Humanities courses are not accepted
[b] MATH 111 and MATH 112 should be taken if needed to adequately prepare for MATH 251. Any credits earned from these courses **do not** apply to the degree program. Consult with an academic advisor for further guidance
[c] Select either MATH 361 or MATH 465
[d] Consult with an academic advisor or program director regarding available and appropriate MECH elective courses. MFG and MET electives **are not** acceptable.
[e] Select either MECH 417 or MECH 418, depending upon which course is currently offered
[f] MECH 221, MECH 222, MECH 223 may be alternatively taken (as an entire sequence) to satisfy the ENGR 211 and ENGR 213 requirements

Graduate Programs

Admissions and Academic Policies

Graduate degree programs at Oregon Institute of Technology provide students with opportunities for advanced study in various disciplines. Graduates will develop the competence required for leadership roles in professional fields. Graduate education at Oregon Tech maintains an applied focus. Our mission is to integrate theory and practice.

Admission

The Office of Admissions, in conjunction with the appropriate academic department, maintains all pertinent information regarding the admission of graduate students.

Admission Requirements

To be considered for admission to a graduate program, an applicant must have a baccalaureate degree from a regionally accredited college or university, as well as a scholastic record that evidences the ability to perform satisfactory graduate work. Specifically, a student shall:

- have completed a four-year college course of study and hold an acceptable baccalaureate degree from an institution accredited by a regional accrediting association
- be in good academic standing at the last college or university attended
- have attained a grade point average of at least 3.0 on a 4.0 scale for the last 90 term (60 semester) units attempted
- have attained a grade point average of at least 3.0 on a 4.0 scale for the last 45 term hours in the major
- satisfactorily meet the professional, personal, scholastic, and other standards for graduate study
- pass qualifying examinations required by specific programs

Unusual circumstances may warrant exceptions to these criteria.

Application as a Degree-Seeking U.S. Resident Student

Degree-seeking students must submit the following items to the Office of Admissions before the deadlines specified in the Application Deadlines section:

- an official admissions application, along with a $50 non-refundable application fee. The application fee is waived for applicants who are currently attending Oregon Tech or who graduated from Oregon Tech within the previous two years
- official transcripts from each post-secondary educational institution attended

Individual programs may have additional requirements. Applicants must submit all required items before admission to the graduate program will be considered. Submitting the items, however, does not ensure admission. Applicants will receive official notification of admission after a review of the application by the Office of Admissions and the graduate program department.

Application as an International Degree-Seeking Graduate Student

Oregon Tech must assess the academic preparation of international students. For this purpose, international students, including those who hold U.S. visas as student exchange visitors or other non-immigrant classifications, should apply early. Official transcripts must be on file at least eight weeks before registration for the first term and, if not written in English, must be accompanied by a certified English translation.

All international applicants from countries in which English is not the native language must take the Test of English as a Foreign Language (TOEFL) or the International English Language Testing System exam (IELTS). A minimum score of 520 paper based TOEFL, 68 internet-based TOEFL or 6 IELTS is required for consideration. This requirement may be waived for some students whose primary language is English. Since the results of this test constitute part of the material reviewed for admission to graduate studies at Oregon Tech, students should arrange to have their test scores sent directly from the testing agency to the Office of Admissions well before the application deadline.

The following is an application checklist for degree-seeking international students:

1. submit the graduate application for admission with the $50 (U.S.) application fee
2. submit the international graduate student supplement to the graduate application form (as well as the Statement of Financial Responsibility form), available from the Admissions Office
3. provide evidence of ability to meet educational expenses at Oregon Tech. The Statement of Financial Responsibility form must be completed and submitted with documentation such as official bank statements and tax returns
4. official academic transcripts of all university course work sent to Oregon Tech
5. for university course work done outside the United States, transcripts must be reviewed by an evaluation service. There are several such services that are acceptable. A "course-by-course evaluation" or a "detail report" is necessary
6. proof of proficiency in the English language. Oregon Tech requires that international graduate students submit official test scores on the Test of English as a Foreign Language (TOEFL) or the International English Language Testing System exam (IELTS). A minimum score of 520 paper-based TOEFL, 68 Internet-based TOEFL, or 6 IELTS is required for consideration. This requirement may be waived for some students whose primary language is English
7. students currently in the United States should submit a photocopy of the I-20 form and passport

Individual programs may have additional requirements.

Application Deadlines

Oregon Tech encourages all prospective students to submit graduate application materials six to nine months in advance of the planned enrollment date. This recommendation is especially important for international students in order to allow sufficient time for visa processing. However, applications will be accepted any time before the deadlines listed below. The recommended entrance time is fall term.

- Fall Term: April 1
- Winter Term: July 1
- Spring Term: October 1

Residency Classification
See the residency section of this catalog.

Tuition and Fees
See the tuition and fees section of this catalog.

Graduate Assistantships
Oregon Institute of Technology offers graduate assistantships, awarded on a competitive basis, to qualified graduate students based on department needs. Compensation varies with the type of service, the amount of time required for performing the service, and the academic qualifications and experience of the appointee. An applicant for a graduate assistantship must be admitted to a graduate program. Graduate departments usually award appointments and assistantships by Summer term, effective at the beginning of the next academic year. A graduate assistant application form is available from the appropriate department.

Types of Assistantships
Graduate assistantships (GAs) at Oregon Tech are either research assistantships (RAs) or teaching assistantships (TAs). Research assistantships are awarded by the faculty member administering the research grant and involve providing assistance in fulfilling the goals and objectives of the grant. Depending upon the grant, research assistantships may include additional support for summer term. If you are interested in a research assistantship, contact the faculty members responsible for the grant.

Teaching assistantships are awarded by the department and involve classroom and laboratory instruction. If you are interested in a TA, contact the individual department to determine availability.

Assistantship Offer
Assistantship notices of appointment are awarded on a term-by-term basis and renewal is dependent upon competent performance of assistantship duties, adequate academic progress, departmental needs, and the availability of funds. Assistantships may include a tuition waiver and/or a monthly stipend based upon a percentage of a full-time equivalent (FTE) salary.

Assistantship Course Load
Graduate assistants are expected to maintain full-time enrollment (nine credits). Graduate assistants not enrolled in nine credits of formal courses must supplement the course load with thesis or project credits to maintain full-time enrollment status.

Satisfactory Progress
Graduate assistants must make satisfactory progress toward a graduate degree to retain a graduate assistantship. Satisfactory progress includes:

- maintaining a 3.0 or higher grade point average
- maintaining full-time student enrollment

Failure to maintain satisfactory academic progress will result in loss of an assistantship.

Academic Policies
The Graduate Council determines graduate academic policies at Oregon Tech. Other academic policies and procedures are described and/or defined in the general policies of Oregon Tech.

Student Rights and Responsibilities
Oregon Tech encourages students to perform at a high academic level, and students are responsible for knowing degree requirements and enrolling in courses that will enable them to complete the master's program. Oregon Tech expects students to conduct themselves in a manner compatible with the university's function as an institution of higher learning. Students should acquaint themselves with regulations for the standard of work required to continue in the graduate school. For additional information, students should consult their graduate advisor.

Academic Integrity
Oregon Tech's goal is to foster an atmosphere that produces educated, literate graduates. Academic misconduct, such as cheating and plagiarism, will not be tolerated. Cheating includes, but is not limited to, the following:

- use of any unauthorized assistance in taking quizzes, tests or examinations
- dependence upon the aid of sources specifically prohibited by instructors in writing papers, preparing reports, solving problems or carrying out other assignments
- the acquisition, without permission, of tests or other academic materials belonging to a faculty member of the school

Plagiarism includes, but is not limited to, the use, by paraphrase or direct quotation, of the published or unpublished work of another person without acknowledging the source. Plagiarism occurs when a student either copies the work of another person and attempts to receive credit for that work or acquires and uses prepared material from someone who is selling academic materials. These examples are intended to provide general guidelines and are in no way comprehensive in describing academic dishonesty.

Faculty may assign specific penalties for cases of academic misconduct, including a failing grade for a test or assignment, a reduced grade for a test or assignment, or a failing grade in the course. Responding to academic dishonesty is the responsibility of the course instructor. If a student commits plagiarism or other academic dishonesty during the graduate project, the advisor, in consultation with the dean, determines the appropriate response.

All graduate students should acquaint themselves with the definitions and implications of academic misconduct as explained in Oregon Tech's student conduct code. Repercussions for a student guilty of academic conduct violations range from a warning to expulsion. Students may contest a charge of

academic misconduct by following the grievance procedure outlined in the OIT catalog and the student handbook, available on the Oregon Tech Web site.

Student Records
The Registrar's Office maintains a permanent file for each graduate student. Faculty advisors will maintain a file of advising records, grade information and other correspondence pertaining to each graduate student's academic progress. For more information on student records, contact the Registrar's Office.

Enrollment Status
Full and part-time credit loads for graduate students are defined as follows:

- Full-time: 9 or more credits
- 3/4 time: 7 - 8 credits
- Half-time: 5 - 6 credits

Oregon Tech undergraduate seniors may enroll in 500-level graduate courses for graduate credit with the approval of the student's undergraduate advisor and the graduate program director.

Students who are not yet admitted to Oregon Tech may take up to one third of the graduate program credits as a non-admit student and apply them toward the graduate degree upon formal admission to the graduate program.

Oregon Tech offers some courses which are dual-listed at the 400- and 500-level. The 400-level courses apply only to an undergraduate degree, while 500-level courses apply to both undergraduate and graduate degrees. Students enrolled in a dual-listed 500-level course will be required to complete additional work to obtain graduate credit.

Continuous Enrollment for All Graduate Students
All graduate degree-seeking students must be continuously enrolled. Continuous enrollment is defined as completing, with grades assigned, a minimum of 1 hour of graduate credit every quarter.

Academic Prerequisite Deficiencies
Students who have prerequisite deficiencies for graduate studies may be required to take additional course work prior to completing their graduate studies, as determined by the graduate program director. If there are deficiencies, the director will recommend substitute courses, and these are entered on the Graduate Program Form. When students pass these courses with a B or better, they become fully qualified graduate students. Prior to completion of the listed courses, the graduate student is considered "provisionally admitted."

Academic Performance Standards
Students must maintain a cumulative GPA of 3.0 or better in all graduate work specific to the program of study to remain in good academic standing. Grades below C do not meet requirements for a graduate degree.

Graduate students earning a cumulative GPA of less than 3.0 will be placed on probation and, if no improvement is made, will be suspended from the graduate program. Conditions established for probation and suspension are listed below:

Academic Probation: Students having 9 or more attempted credit hours will be placed on academic probation for each term that their cumulative GPA falls below 3.0.

Academic Suspension: A student on probation must maintain a term GPA of 3.0 or higher to avoid academic suspension. A student will be suspended if the student's term GPA falls under 3.0 while on probation. Suspended students lose their institutional financial aid, including graduate research and teaching assistantships. A student may appeal academic suspension by following the process outlined in the Oregon Tech catalog. A successful appeal results in probation status.

Transfer Credits
Students may petition to transfer up to one third of the program graduate term hours earned at other accredited institutions and apply those credits toward an Oregon Tech graduate degree. However, each course must be consistent with the program of study planned by the student and the graduate advisor. Only grades of A and B are acceptable as transfer credit into the graduate program.

Grading Policy
Oregon Tech uses a 4.0 grading scale to evaluate student performance. Upon completion of a course or upon termination of attendance in the course, a student's performance will be graded by the instructor and reported to the Registrar's Office.

Requirements
Graduate degree academic requirements are specified by the program. The student, in conference with the graduate faculty advisor, will prepare a program of study for the graduate degree as a guide for planning an academic schedule.

Application for Graduation
To apply for graduation, the student must submit a petition for graduation to the Registrar's Office two terms in advance of the anticipated final term of work. The petition is a record of the approved program of study. To receive favorable action, candidates must meet the following requirements:

- show that course requirements for the master's degree will be satisfied before or during the final term
- maintain an overall grade point average of at least 3.0
- provide evidence of passing any qualifying or comprehensive examinations, including defense of the master's project or thesis

- obtain approval of both the student's academic advisor and department chair, or by the program director or other faculty member in the event that the student's academic advisor is the department chair

Right of Appeal

Philosophy of Policy Application

The graduate student academic grievance procedure provides a mechanism for exchanging information between student and instructor in cases of grade dispute and a safeguard against unfair grading practices. The intent is to provide an informal forum for discussing and resolving differences of opinion.

Academic Disputes Appealable by Policy

Student claims that final course grade resulted from:

1. unfair or prejudicial treatment by instructor
2. unusual or irregular procedures that impacted an individual student's grade in a disproportionate manner
3. dismissal from a professional program or externship because of failure to meet prerequisite or sequential course requirements

Note: The student should initiate appeals of final grades or professional academic standing within three weeks after distribution of final course grades or dismissal notice. The appropriate academic dean will not consider appeals after that time limit unless the student was incommunicado with the campus or unable to obtain grades after distribution because of academic assignment, or unusual events associated with grading procedure or completion of assignments made it impossible for the student to receive or appeal the grade in a timely manner.

Academic and Related Disputes Not Appealable by Policy

1. Grades assigned to tests, quizzes, homework, papers, projects, or other components of a course
2. Final grades based on failure to meet published (via syllabus) standards for the course that involves no unusual or prejudicial treatment
3. Disciplinary or other student conduct matters not specifically covered above
4. Challenges to the instructor's grading system or components thereof, as long as the system was made available to students at the beginning of the academic term

Procedure

1. Student reads policy to determine if grievance is appealable
2. Student makes appointment to discuss dispute with course instructor. Since reconciliation of the dispute at this level is in the best interests of all parties, instructors and students are urged to engage in an honest and open-minded effort to resolve the problem
3. Failing to resolve the dispute with the instructor, the student makes an appointment with the program director and department chair. The student and the instructor document the dispute in writing and bring this to the meeting. Department chair and program director should confer with instructor before consultation with the student. Department chair decides dispute based on available information.
4. If the student disagrees with the decision, s/he may request an appointment with the appropriate dean. The appropriate dean will not see students unless they have followed the preceding steps. If the course instructor is the department chair, the second level of appeal is the appropriate academic dean. The appropriate dean contacts the department chair and program director, and, when appropriate, the course instructor, to obtain information about the dispute. After consultation with the department and the student, the appropriate academic dean offers the student the choice of a summary decision or the opportunity for a hearing with the Graduate Council.

Summary Decision by Academic Dean

If the appropriate academic dean summarily decides the dispute, the grievance is terminated and the department chair, program director, instructor, and the student are notified in writing. If a grade change results, the Registrar's Office is also notified in writing.

Graduate Council Hearing

If the student elects to have the dispute referred to the Graduate Council,

1. The student must prepare a written request, summarizing the reasons for a hearing and the requested intervention (e.g., change of grade, reinstatement), with supporting documentation attached. The request is presented to the academic dean within three academic days after discussion with the dean.
2. The council schedules a hearing at the earliest time mutually available, normally within five academic days after the academic dean receives the request.
3. The department chair and program director receive a copy of the student request and supporting documentation.
4. The Graduate Council chair convenes the hearing and considers the presentations of student and instructor. Either may call witnesses to offer supporting information. The student has the right to have an advisor or attorney. The advisor may be at the student's side, and the student may consult with the advisor, but the advisor may not address or question the council.
5. The council formulates and sends a recommendation, supported by a rationale, to the academic dean. It may include a majority and minority report, if appropriate.
6. After careful consideration of the council's findings, the academic dean renders a final decision and notifies the council, department chair, program director, instructor and student. If the outcome is a grade change, the academic dean notifies the Registrar's Office.

Time Limits

Graduate students are allowed five years to complete all the requirements for a master’s degree. Under extenuating circumstances, students may request an extension. The extension must be approved by the Program Director, the Department Chair, and the Associate Provost.

Course Descriptions

Course descriptions in this section are reasonable summaries only and are neither completely inclusive nor completely exclusive of total course content for any given course.

Courses listed herein may or may not be offered each term. Courses are listed alphabetically according to prefix.

Numbering Code

Courses are grouped into a three-digit number series which indicates the normal teaching levels. Some variations may occur.

1-99 Preparatory and Developmental Courses. Courses numbered below 100 are not applicable toward a degree even though units are assigned, grades are awarded and tuition is assessed.

Lower-Division Courses (freshman and sophomore)
100-199 First-Year Courses
200-299 Second-Year Courses

Upper-Division Courses (junior and senior)
300-399 Third-Year Courses
400-499 Fourth-Year Courses

Graduate Courses
500-599 Graduate Courses

Special Terms

As Required: This term designates a course or series of courses which will be offered only as enrollment, student interest, or individual department needs demand and as staffing allows. A course so designated may be offered if special student needs, situations of extreme hardship, or other unusual circumstances deem it in the best interest of both the student(s) and the institution to do so.

Hours to be Arranged Each Term: Normally students negotiate individually with faculty members and/or departments and arrange to have courses so designated offered for the term most suitable to their unique situation.

Corequisite: A course that must be taken simultaneously with another course. Corequisites are noted at the end of each course description.

Prerequisite: A course that must be passed satisfactorily before another course may be taken. Prerequisites are noted at the end of each course description. Courses transferred in to Oregon Tech with a C- or better meet the prerequisite requirement of obtaining a C or better.

Quarter Credit: A credit hour is an amount of work represented in intended learning outcomes and verified by evidence of student achievement that is an institutionally established equivalency that reasonably approximates not less than:

1. One hour of classroom or direct faculty instruction and a minimum of two hours of out-of-class student work each week for approximately fifteen weeks for one semester or trimester hour of credit, or ten to twelve weeks for one quarter hour of credit, or the equivalent amount of work over a different amount of time; or
2. At least an equivalent amount of work as required in paragraph (1) of this definition for other academic activities as established by the institution, including laboratory work, internships, practicals, studio work, and other academic work leading to the award of credit hours.

A numerical credit value assigned to certain number of lecture or laboratory hours. A lecture class meeting for three 50-minute periods a week would be assigned three units of credit. Students have traditionally been expected to spend an additional six hours of outside class work per week for each three units of lecture class credit. Generally, a lab class requires three hours per week for one unit of credit, or a total of nine in-lab hours with no additional outside class work expected for three units of lab class credit.

Reading and Conference: A course taken on an independent study basis with the supervision of an instructor, usually consisting of weekly conferences, assigned readings, research papers, etc.

Seminar: A class taught by a group discussion process rather than by means of formal lecture. Student research and reporting are usually expected.

Sequence: A series of classes in the same subject area that, taken as a whole, comprise a full year's work. Generally, course sequences are numbered consecutively, and often (though not always) should be taken in the numerical order listed (i.e., CHE 201 should be taken before CHE 202, etc.).

Applied Behavior Analysis

ABA 501 - ABA Colloquium
Lecture Hours: 1
Lab Hours: 0
Credit Hours: 1
Weekly seminar focused on current topics, research in ABA. May be repeated for credit.

ABA 507 - Seminar
Lecture Hours: 7
Lab Hours: 0
Credit Hours: 7
(Hours to be arranged each term.)

ABA 511 - Foundations of ABA I
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Basic principles, characteristics, and concepts of Applied Behavior Analysis (ABA). Includes history of ABA, terminology, and applications.

ABA 512 - Foundations of ABA II
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Foundational knowledge for practice of Applied Behavior Analysis (ABA): basic principles, characteristics an concepts of ABA.
Prerequisite: ABA 511 with grade "B" or better

ABA 515 - Basic Behavior Analysis
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Experimental analysis of behavior, human and non-human research, basic principles of operant and respondent conditioning.

ABA 516 - ABA and Human Development
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Typical and atypical development across the lifespan, emphasis on behavioral theories, principles, and applications.
Prerequisite: ABA 512 with grade "B" or better

ABA 521 - Ethics & Professional Issues I
Lecture Hours: 2
Lab Hours: 0
Credit Hours: 2
Introduction to ethical and professional issues in Applied Behavioral Analysis (ABA). Compliance Code and professional identity, certification and licensure, confidentiality and privacy.

ABA 522 - Ethics & Professional Issues II
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Examines ethical and professional issues in Applied Behavior Analysis (ABA) focus on Compliance Code and application to ethical and professional conduct, ethical decision making, and professional practices.
Prerequisite: ABA 521 with a grade "B" or higher

ABA 524 - Observations and Measurements
Lecture Hours: 2
Lab Hours: 0
Credit Hours: 2
Theory and practice related to the BACB Task List items related to observation and measurement including: methods for conducting valid and reliable direct observation techniques including data collection, data display, and data interpretation; methods for calculating inter-observer agreement.
Corequisite: ABA 525

ABA 525 - Research Methods in ABA
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Methods for conducting valid and reliable behavioral measurement and experimental evaluations of behavioral interventions, including data collection, data display, and data interpretation and designing and evaluating behavioral research designs.
Corequisite: ABA 524

ABA 526 - Behavioral Assessment I
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Behavioral assessment including descriptive assessments and functional analysis; methods of assessment, data collection and interpretation; assessment based selection of intervention; ethical and practical issues.
Prerequisite: ABA 524 with grade "B" or better

ABA 527 - Radical Behaviorism
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Concepts, principles, history, and philosophy of behaviorism; behavioral theory and understanding behavior.
Prerequisites: ABA 512 with grade "B" or better

ABA 531 - Behavioral Change I: Decreasing Challenging Behavior
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Behavioral analytic interventions used to decrease behavior. Fundamental elements of, and ethical and practical considerations related to behavior change, behavioral interventions, behavior change systems, and specific behavior change procedures.
Prerequisite: ABA 512 with grade "B" or better

ABA 532 - Behavioral Change II: Increasing and Maintaining Behavior
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Behavior analytic interventions used to increase and maintain behavior. Fundamental elements of, and ethical and practical considerations related to behavior change, behavioral interventions, behavior change systems, and specific behavior change procedures.
Prerequisite: ABA 531 with grade "B" or better

ABA 535 - Special Topics in ABA
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Examination of systems, interventions, current issues, and/or advances in Applied Behavior Analysis; includes focus on strategies for managing program implementation and supervision of behavioral change agents. Topics vary.
Prerequisites: ABA 525 and ABA 531

ABA 536 - Behavior, Physiology, and Pharmacology
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Interrelationship of physiological and behavioral processes, includes psychotropic medications, drug effects and interactions.
Prerequisite: ABA 515 with grade "B" or better

ABA 546 - Behavioral Assessment II
Lecture Hours: 2
Lab Hours: 0
Credit Hours: 2
Assessment and measurement techniques related to skill deficits in children and adolescents with developmental or intellectual disability. Includes VB-MAPP, ABLLS, PEAK, EFL, AFLS, Vineland, social skills assessments, and others.
Prerequisite: ABA 526 with grade "B" or better

ABA 547 - Supervision and Management
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Methods of behavior analytic personnel supervision and management including but not limited to ethical and professional responsibilities, establishing performance standards and goals, feedback, behavior skills training, problem solving, and evaluation of the effectiveness of supervision. Additionally, this course will serve to fulfill the curriculum requirement for the BACB Supervisor 8-Hour Training based on the Supervisor Training Curriculum (2.0).
Prerequisite: ABA 521 with grade "B" or better

ABA 565 - Organizational Behavior Management
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Application of the theory, principles, and

methods of behavior analysis in businesses, industries, human service organizations, and governments.
Prerequisites: ABA 522, ABA 525, and ABA 532 all with grade "B" or better

ABA 566 - ABA and Education
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Applications of behavior analysis in education; instructional design and classroom behavior management applications in education, special education, and college instruction.
Prerequisites: ABA 525 and ABA 532, both with grade "B" or better

ABA 567 - ABA and Health
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Application of the theory, principles, and methods of behavior analysis to areas of behavioral medicine, individual health, and public health.
Prerequisites: ABA 522 and ABA 536, both with grade "B" or better

ABA 575 - Community Behavior Analysis
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Applications of behavior analysis in the community; historical developments, conceptual issues, and practical issues are examined; applications to socially significant issues.
Prerequisites: ABA 525 and ABA 532, both with grade "B" or better

ABA 576 - Clinical Behavior Analysis
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Clinical applications of behavior analysis; focus on methods, theory, and evidence-based practices.
Prerequisites: ABA 522, ABA 525, and ABA 532, all with grade "B" or better

ABA 577 - ABA and Special Populations
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Applications of behavior analysis across diverse populations including intellectual and developmental disabilities, autism, and brain injury; ethical, legal, and practical considerations.
Prerequisites: ABA 521, ABA 525, and ABA 532, all with grade "B" or better

ABA 598 - Supervised Practicum
Lecture Hours: 2
Lab Hours: 0
Credit Hours: 2
Supervised experience in Applied Behavior Analysis. Designed to meet Intensive Practicum experience standards and supervisory requirements of the Behavior Analysts Certification Board (BACB®). Students will have the opportunity to develop proficiency in behavior analytic consultation and service delivery. May be repeated for credit.

ABA 599 - Thesis
Lecture Hours: 1
Lab Hours: 0
Credit Hours: 1
Supervised research experience for the thesis leading to the master's degree in Applied Behavior Analysis. May be repeated for credit.
Prerequisites: ABA 521, ABA 525, and ABA 531, all with grade "B" or better

Academic Success

ACAD 101 - Student Success Sem
Lecture Hours: 0
Lab Hours: 0
Credit Hours: 2
A course to facilitate the success of first year students at OIT. Emphasis on faculty-student and student-student interactions. Includes academic resources, campus services, the learning process, communication skills, health and wellness issues. May also include academic skills and career planning.

ACAD 105 - Achieving Academic Success
Lecture Hours: 2
Lab Hours: 0
Credit Hours: 2
Course identifies attitudes, behaviors, and specific strategies that will lead to academic success at the college level. Topics may include study habits, time management, strategies for memorization and test-taking, and goal-setting.

ACAD 107 - Seminar
Lecture Hours: 0
Lab Hours: 0
Credit Hours: 12
(Hours to be arranged each term.)

ACAD 115 - Career Exploration
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Effective academic and career decision-making is facilitated by thorough self-assessment, exploration of the world of work, and identification of appropriate academic majors. Course includes activities such as personality type testing, research, visits to academic departments, and information interviews with professionals in various occupations.

ACAD 120 - Stress Management
Lecture Hours: 0
Lab Hours: 0
Credit Hours: 2
Identifies signs and symptoms of stress as well as the ways in which they impact student academic success. Effective ways of dealing with stress, including relaxation techniques, will be identified, discussed and practiced.

ACAD 135 - Reading Tutor
Lecture Hours: 2
Lab Hours: 0
Credit Hours: 2
For 'America Reads' tutors. Provides information about how children learn to read and write strategies for teaching children, and working in an elementary school.

ACAD 207 - Seminar
Lecture Hours: 0
Lab Hours: 0
Credit Hours: 12
(Hours to be arranged each term.)

ACAD 307 - Seminar
Lecture Hours: 0
Lab Hours: 0
Credit Hours: 12
(Hours to be arranged each term.)

ACAD 407 - Seminar
Lecture Hours: 0
Lab Hours: 0
Credit Hours: 12
(Hours to be arranged each term.)

Accounting

ACC 101 - Intro to Accounting
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
The principles of elementary accounting systems for small businesses.

ACC 107 - Seminar
Lecture Hours: 0
Lab Hours: 0
Credit Hours: 12
(Hours to be arranged each term.)

ACC 115 - Basic Income Tax Prep
Lecture Hours: 2
Lab Hours: 4
Credit Hours: 3
Federal and state laws, ethics, and regulations applicable to individual income tax returns. Prepares tax preparers for the qualifying examination and meets the personal needs of individuals preparing their own returns.

ACC 124 - Business Math/Machines
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Business math such as decimals, percents, markups, proration, and interest. Emphasis on operational techniques of electronic calculators for problem solving.

ACC 201 - Prin of Accounting I
Lecture Hours: 4
Lab Hours: 0
Credit Hours: 4
Introduction to terminology, content, and form of financial statements for sole proprietorships. Recording of data for use in preparing profit-and-loss statements and

balance sheets.
Prerequisite: MATH 100 or equivalent

ACC 202 - Prin of Accounting II
Lecture Hours: 4
Lab Hours: 0
Credit Hours: 4
A continuation of ACC 201 with emphasis on corporate accounting.
Prerequisite: ACC 201 with grade "C" or better

ACC 203 - Prin of Managerial Acct
Lecture Hours: 4
Lab Hours: 0
Credit Hours: 4
Theory and procedure in gathering cost data and their use in analyzing and controlling operation costs: job-order and process-cost systems. Technique of standard costs, analysis of variance, managerial reports, and specialized cost programs including activity based costing systems.
Prerequisite: ACC 201 with grade "C" or better

ACC 205 - Computerized Accounting
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
Spreadsheet software used to solve accounting problems, model-building techniques. Integrated accounting software introduced.
Prerequisite: ACC 201

ACC 207 - Seminar
Lecture Hours: 6
Lab Hours: 0
Credit Hours: 6
(Hours to be arranged each term.)

ACC 245 - Payroll Accounting
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Covers federal and state laws pertaining to wages, payroll taxes, payroll tax forms, and journal and general ledger transactions. Emphasis is placed on computing wages; calculating social security, income, and unemployment taxes; preparing appropriate payroll tax forms; and journalizing/posting transactions.
Prerequisite: ACC 101 or ACC 201

ACC 295 - Individual Studies
Lecture Hours: 6
Lab Hours: 0
Credit Hours: 6
(Hours to be arranged each term.)

ACC 298 - Reading and Conference
Lecture Hours: 6
Lab Hours: 0
Credit Hours: 6
(Hours to be arranged each term.)

ACC 299 - Laboratory Practice
Lecture Hours: 0
Lab Hours: 6
Credit Hours: 6
(Hours to be arranged each term.)

ACC 307 - Seminar
Lecture Hours: 6
Lab Hours: 0
Credit Hours: 6
(Hours to be arranged each term.)

ACC 320 - Cost Accounting I
Lecture Hours: 4
Lab Hours: 0
Credit Hours: 4
Cost accumulation systems including job order costing, process costing and activity-based costing will be explored. Techniques to control and evaluate operations including variance analysis based on flexible budgets and standard costs.
Prerequisite: ACC 203 with grade "C" or better

ACC 321 - Cost Accounting II
Lecture Hours: 4
Lab Hours: 0
Credit Hours: 4
Continuation of Cost Accounting I. Strategic planning and financial budgeting. Cost measurement, planning, control and performance evaluation and behavioral issues. The role or responsibility accounting for revenue, cost, contribution and profit centers will be investigated.
Prerequisite: ACC 320 with grade "C" or better

ACC 325 - Finance
Lecture Hours: 4
Lab Hours: 0
Credit Hours: 4
Emphasis on working capital management, long-term finance, and capital structure.
Prerequisites: ACC 203, and MATH 105 or MATH 111

ACC 331 - Interm Accounting I
Lecture Hours: 4
Lab Hours: 0
Credit Hours: 4
Financial accounting concepts, theory, and practices involving current asset accounts; practical application of theory to accounting problems.
Prerequisite: ACC 202 with grade "C" or better

ACC 332 - Interm Accounting II
Lecture Hours: 4
Lab Hours: 0
Credit Hours: 4
Accounting concepts, theory, and practices involving ownership equities, interpretation, analysis of financial statements, and correction of errors; practical application of theory to accounting problems.
Prerequisite: ACC 331 with grade "C" or better

ACC 333 - Interm Accounting III
Lecture Hours: 4
Lab Hours: 0
Credit Hours: 4
Accounting concepts, theory, and practices involving plant assets, intangible assets and liabilities; practical application of theory to accounting problems.
Prerequisite: ACC 332 with grade "C" or better

ACC 405 - Accounting Info Sys
Lecture Hours: 4
Lab Hours: 0
Credit Hours: 4
Analysis of accounting cycles and the associated controls with emphasis on problem solving and critical thinking. Includes computerized accounting system implementation.
Prerequisites: ACC 332, MIS 275, and MIS 312

ACC 407 - Seminar
Lecture Hours: 6
Lab Hours: 0
Credit Hours: 6
(Hours to be arranged each term.)

ACC 411 - Income Tax Procedures
Lecture Hours: 4
Lab Hours: 0
Credit Hours: 4
Federal and state income tax laws and regulations applicable to individuals and their businesses including computerized tax return preparation.
Prerequisite: ACC 333 with grade "C" or better

ACC 412 - Corporate Taxation
Lecture Hours: 4
Lab Hours: 0
Credit Hours: 4
Federal tax law applicable to corporations, partnerships, and estates. Emphasis on tax research procedures, and locating and evaluating various sources of tax law.
Prerequisite: ACC 411 with grade "C" or better

ACC 421 - Income Tax Procedures Lb
Lecture Hours: 0
Lab Hours: 6
Credit Hours: 2
Lab accompanying class content in ACC 411.

ACC 431 - Advanced Accounting I
Lecture Hours: 4
Lab Hours: 0
Credit Hours: 4
Comprehensive study of problems in partnership accounting, fund accounting, branch accounting, and governmental accounting.
Prerequisite: ACC 333 with grade "C" or better

ACC 432 - Advanced Accounting II
Lecture Hours: 4
Lab Hours: 0
Credit Hours: 4
Analysis of problems facing small, medium, and large companies, with emphasis upon an integrated and concurrent decision

making methodology applying economics, finance, accounting and tax theory.
Prerequisite: ACC 431 with grade "C" or better

ACC 435 - Auditing
Lecture Hours: 4
Lab Hours: 0
Credit Hours: 4
Introduction to auditing concepts and practices. Topics include professional standards, audit planning and procedures, ethical considerations, internal controls, professional responsibilities, the acquisition and evaluation of audit evidence, and report writing.
Prerequisites: ACC 333 and ACC 405, both with grade "C" or better

ACC 465 - Case Studies in Accounting
Lecture Hours: 4
Lab Hours: 0
Credit Hours: 4
The use of accounting cases to develop problem solving/critical thinking skills. Application of the case methodology to all areas of accounting.
Prerequisites: ACC 431, ACC 435, and ACC 496, all with grade "C" or better

ACC 496 - Senior Project
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Development and implementation of an accounting related project for the benefit of an external entity and the student. Projects will include a proposal, analysis, design, and implementation. An oral presentation and project documentation will be required at the completion of each course.
Prerequisites: ACC 320 and ACC 405, or instructor consent

ACC 497 - Senior Project
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Development and implementation of an accounting related project for the benefit of an external entity and the student. Projects will include a proposal, analysis, design and implementation. An oral presentation and project documentation will be required at the completion of each course.
Prerequisites: ACC 320 and ACC 405, or instructor consent

Allied Health Education

AHED 107 - Seminar
Lecture Hours: 0
Lab Hours: 0
Credit Hours: 12
(Hours to be arranged each term.)

AHED 207 - Seminar
Lecture Hours: 0
Lab Hours: 0
Credit Hours: 12
(Hours to be arranged each term.)

AHED 307 - Seminar
Lecture Hours: 0
Lab Hours: 0
Credit Hours: 12
(Hours to be arranged each term.)

AHED 407 - Seminar
Lecture Hours: 0
Lab Hours: 0
Credit Hours: 12
(Hours to be arranged each term.)

AHED 450 - Instructional Methods
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Students develop instructional content and an instructional plan for teaching topics for adult learners. Teaching methods, learning styles, student and instructor evaluation, and use of media will be discussed.
Prerequisite: DH 380, or admission to the RCP or BDH degree completion program

AHED 451 - Instructional Experience
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
Students create and structure their own instructional experience, participate in a clinical or laboratory setting as a supervising instructor, present a didactic unit using visual aids.
Prerequisite: AHED 450

AHED 452 - Instructional Practicum
Lecture Hours: 0
Lab Hours: 9
Credit Hours: 3
Student and Faculty advisor design an individualized teaching experience. A learning contract is written and implemented.
Prerequisite: AHED 451 or AHED 460

AHED 460 - Fund of Distance Education
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Students learn the fundamentals of online teaching and learning. Lesson plan developed in AHED 450 will be finalized as an online module. Synchronous vs. asynchronous learning, instructional design and course management as it relates to online instruction will be discussed.
Prerequisite: AHED 450

Allied Health

ALH 505 - Intro to IT for Hlth Care Pros
Lecture Hours: 1
Lab Hours: 0
Credit Hours: 1
Students will get an introduction to information technology (IT) as it applies to healthcare and in learning IT tools for success in online education.
Prerequisite: Admission to the MSAH program

ALH 506 - Program Administration
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
The roles, responsibilities and functions of administrators in healthcare and educational environments.

ALH 508 - Medical Ed. Theories & Methods
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Instructional methods for allied health educators. Emphasis on lesson plan design to meet learning style needs of adult learners. Learning objectives, active teaching strategies, traditional and non-traditional assessment, and evaluation are addressed for teaching in an on-campus or online environment.

ALH 509 - Masters Capstone Project
Lecture Hours: 6
Lab Hours: 0
Credit Hours: 6
The capstone project is designed as a culminating clinical experience and provides an alternative to the thesis option. The student must present a formal capstone project plan prior to beginning the project to his/her graduate committee. Upon completion of the experience, the student will provide a written evaluation of the project. The student will also perform an oral presentation and oral defense to his/her committee.
Prerequisite: Admission to the MSAH program

ALH 510 - The Science of Evidence-Based Medicine
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Modern health practices often claim that they are "evidence based", but sometimes the quality of the evidence isn't as good as one would hope. This course looks at a variety of medical and health issues and evaluates the reliability of the evidence. Topics include menopausal hormone replacement therapy, screening for breast, prostate, thyroid and colon cancer, and nutritional/dietary recommendations.
Prerequisite: Admission to the MSAH program

ALH 515 - Scientific Writing & Healthcare
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
A large focus of this class is in reading and interpreting scholarly literature related to healthcare leadership. In addition, students will be learning to write using instructor led professional and scientific methods.
Prerequisite: Admission to the MSAH program

ALH 525 - Effective Healthcare Ldshp
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
The students will explore best practices in team leadership including team theories and safety concerns as they apply to healthcare. Real life case examples will be taught and the students will be able to practice their team leadership skills to learn how to effectively lead healthcare teams.
Prerequisite: Admission to the MSAH program

ALH 535 - Assmt. Plan. Imp. and Eval.
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Focus is teaching students to assess needs, plan effectively, implement changes and evaluate their own success in a healthcare setting.
Prerequisite: Admission to the MSAH program

ALH 545 - Pertinent Ethical & Legal Cons
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Common real-life healthcare ethical cases will be presented and discussed in this class with a focus on the role of a healthcare leader in handling difficult ethical situations. Healthcare legalities will be introduced to help with liability and malpractice, etc.
Prerequisite: Admission to the MSAH program

ALH 555 - Leadership Theory for HC Ldrs.
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
A wide range of scholarly leadership theories will be discussed, ranging from military leadership models to Gardiner's Servant Leadership Model. Students will self-assess to evaluate their own leadership and communication styles along with their own power and influence styles. These research based leadership theories will be applied to healthcare leadership and best practices.
Prerequisite: Admission to the MSAH program

ALH 565 - Population Health Issues for Allied Health Professionals
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Population health issues and needs will be discussed in all aspects particularly as it applied to healthcare leadership.
Prerequisite: Admission to the MSAH program

ALH 575 - Methods of Research for Allied Health Professionals
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
The various types of healthcare research will be discussed including qualitative, quantitative, and mixed methods. Students will design their own research project that will include data collection and analysis, with particular attention given to the planning process of the research and choosing appropriate methodology.
Prerequisite: Admission to the MSAH program

ALH 585 - Financial Consid. & Pol. Strat
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Students will be introduced to best practices in healthcare finances including health care policies and funding sources. The emphasis will be to teach students how to incorporate successful financial models into their own healthcare organizations. Discussions will take place to include the best practices in using political models and strategies related to demand and supply within healthcare settings.
Prerequisite: Admission to the MSAH program

ALH 595 - Curriculum Design for AHP
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Creating the best healthcare curriculum that ensures the best practices and student outcome will be emphasized. How to manage healthcare curriculum with consideration to needs assessment and program specific accreditation standards will be discussed.
Prerequisite: Admission to the MSAH program

ALH 599 - Master's Thesis Presentation
Lecture Hours: 6
Lab Hours: 0
Credit Hours: 6
The topic of thesis must be approved by the Program Director. The student and Program Director will help form a committee of three faculty members to serve in an advisory role. The thesis topic will be selected by the candidate with the advice and approval of the Program Director. The student must prepare a written document describing the research problem, purpose, data collection, data analysis, research methods, interpretation methods and any other concerns related to the research. After the thesis topic has been researched and written, the student will perform an oral presentation and oral defense to his/her committee.
Prerequisite: Admission to the MSAH program

Anthropology

ANTH 101 - Intro to Physical Anthropology
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
An introduction to physical anthropology, emphasizing man's place in the animal kingdom, evolution of man, fossil hominid forms, Paleolithic cultures, and principles of genetics. Satisfies either a science elective or a social science elective.

ANTH 102 - Intro to Archaeology
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Survey of the science of archaeology. Covers the biological and social evolution of the human species with emphasis on the growth of human populations and social complexity. Relates site-specific evidence to theories of social change. Discusses field and laboratory methods of archaeology.

ANTH 103 - Intro to Cultural Anthropology
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Culture, language, subsistence patterns, group formation, kinship, economic systems, political organizations, religion, and cultural change.

ANTH 107 - Seminar
Lecture Hours: 0
Lab Hours: 0
Credit Hours: 12
(Hours to be arranged each term.)

ANTH 207 - Seminar
Lecture Hours: 6
Lab Hours: 0
Credit Hours: 6
(Hours to be arranged each term.)

ANTH 307 - Seminar
Lecture Hours: 0
Lab Hours: 0
Credit Hours: 12
(Hours to be arranged each term.)

ANTH 335 - The Built Environment
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
An examination of the American built environment from historical to modern times and the role it plays in shaping American Society. The topics include city planning, architecture, transportation technologies, dam and bridge building, and urban sprawl.

ANTH 407 - Seminar
Lecture Hours: 6
Lab Hours: 0
Credit Hours: 6
(Hours to be arranged each term.)

ANTH 452 - Globalization
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Addresses what globalization is and how it developed and spread. Benefits and harms of globalization in the areas of work, culture, warfare, national sovereignty, health, and food. Countervailing pressures from social movements will be examined.
Prerequisite: WRI 122

Art

ART 107 - Seminar
Lecture Hours: 15
Lab Hours: 15
Credit Hours: 15
(Hours to be arranged each term.)

ART 205 - Introduction to Watercolors
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Introductory studio course in beginning watercolor painting. Students will learn a variety of watercolor techniques as well as elements of design and aesthetics.

ART 207 - Seminar
Lecture Hours: 6
Lab Hours: 0
Credit Hours: 6
(Hours to be arranged each term.)

ART 210 - Beginning Sculpture
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Introductory studio course in beginning sculpture, emphasizing basic materials and techniques.

ART 215 - Design Arts and Aesthetics
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Students learn how to think like designers through critical analysis of design principles, enabling them to differentiate between good and bad design as well as how to influence perception, increase appeal, and problem solve when designing.

ART 220 - Basic Drawing
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Designed for the student who has an interest in exploring the field of pictorial representation but has had, for a variety of reasons, little opportunity to do so.

ART 226 - Digital Photography
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Studio course in digital photography, studying and producing photographs. Focus on digital exposures, color, location, Photoshop techniques and issues in photography. Students must have the use of a digital SLR camera or a digital camera with manual settings.

ART 280 - Introductory Painting
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Offers an opportunity to study rendering in color by exposure to a study of color and color mixing, tones, and values with an introduction to acrylics, watercolors, and oils.

ART 282 - Intro to Acrylic Painting
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Introductory studio course with emphasis on basic materials and techniques in acrylic painting.

ART 307 - Seminar
Lecture Hours: 15
Lab Hours: 15
Credit Hours: 15
(Hours to be arranged each term.)

ART 315 - Design Thinking
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Students learn how to collaborate and tackle complex problems through creative design strategies, and develop an ability to define the problem, increase empathy, ideate and pitch their idea.
Prerequisite: Junior standing

ART 407 - Seminar
Lecture Hours: 6
Lab Hours: 0
Credit Hours: 6
(Hours to be arranged each term.)

Biology

BIO 101 - Intro to Cell Biology
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Introduction to cell biology, genetics, basic chemistry of living organisms, and the scientific method.

BIO 102 - Diversity of Life
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Evolution and phylogenetics among all major groups of living organisms, including bacteria, protists, fungi, plants and animals.

BIO 103 - Intro to Human Anat & Phys
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Basic human anatomy and physiology, including a survey of all major bodily systems. (Cannot be used for graduation credit by students who have taken BIO 231, BIO 232, and BIO 233).

BIO 105 - Microbiology
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Classification, morphology, reproduction, transmission, and control of micro-organisms causing disease in man. Laboratory practice in culturing methods, microscopic observation, and physical and chemical control.

BIO 107 - Seminar
Lecture Hours: 15
Lab Hours: 15
Credit Hours: 15
(Hours to be arranged each term.)

BIO 109 - Intro to Medical Sciences
Lecture Hours: 1
Lab Hours: 2
Credit Hours: 2
Survey of medical and health-related occupations, including biomedical sciences. Discussion of health care structure, private and public entities, the research community, and trends in health education and practice.

BIO 135 - Prep for Human A&P
Lecture Hours: 1
Lab Hours: 0
Credit Hours: 1
Study techniques for a science course are explored using examples of Human Anatomy and Physiology.
Corequisite: BIO 231

BIO 200 - Medical Terminology
Lecture Hours: 2
Lab Hours: 0
Credit Hours: 2
Basic structure of medical works including prefixes, suffixes, roots and combining forms. Correct spelling, pronunciation, and meaning of terms are stressed.

BIO 205 - Nutrition
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
A study of the relationships of food and nutrition to health. An overview of the basic nutrition principles including the nutrients and how they function in the body, nutrient requirements, diet planning, and energy balance. Current topics and controversies are examined.

BIO 207 - Seminar
Lecture Hours: 6
Lab Hours: 6
Credit Hours: 6
(Hours to be arranged each term.)

BIO 209 - Current Research Tpc Med Sci I
Lecture Hours: 1
Lab Hours: 0
Credit Hours: 1
Introduces students to topics in medicine focusing on global health issues, infectious and chronic diseases. Projects in medical literature research, understanding scientific

paper format, preparing technical presentations and public speaking.
Prerequisite: Biology or Health Sciences major, or instructor consent

BIO 211 - Principles of Biology
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Principles of modern biology emphasizing form and function of multicellular plants, major invertebrate phyla, and general vertebrate morphology and physiology.

BIO 212 - Principles of Biology
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Principles of modern biology emphasizing evolution, ecology, population genetics, and behavior of organisms.

BIO 213 - Principles of Biology
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Principles of modern biology emphasizing the biochemical basis for life processes, cell structure, and function. Molecular genetics, cell reproduction, metabolism, and form and function of microorganisms.

BIO 216 - Intro to Veterinary Medicine
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Covers many aspects of animal health care and their impact society. Discussions cover husbandry, anatomy, preventive medicine, common diseases and behavioral problems of dogs, cats, horses and exotics. Some hands-on work with dogs, horses, and wildlife is included.

BIO 220 - Cardiovascular Physiology
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Application of principles of fluid dynamics to the human vascular system. Detailed considerations of cardiac function and its regulation, analysis of flow in arterial, venous and capillary systems, and integration of cardiovascular regulation.
Prerequisite: BIO 233

BIO 226 - Intro to Wildlife Rehab
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Principles of wildlife rehabilitation including state and federal laws, medical terminology, basic anatomy, natural history and diet, form and function, and euthanasia. Field captures, basic restraint, first aid, minimum housing requirements, and zoonotic diseases are also included.

BIO 227 - Intro to Forensic Science
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
An entry level course exploring the methodologies and procedures utilized by crime scene investigators and forensic laboratories. Emphasis on crime scene investigation, recognition, documentation, and collecting of physical evidence. Laboratory exercises provide hands-on opportunities supplementing lecture topics.

BIO 231 - Human Anatomy/Physiology I
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Introduction to the systematic studies of human anatomy and physiology. Introduction to cytology and histology followed by the integumentary, skeletal, muscular and endocrine systems and the physiology of excitable tissues. The laboratory sessions emphasize human anatomy using models and human cadavers.

BIO 232 - Human Anatomy/Physiology II
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
A continuation of the systematic study of human anatomy and physiology. The nervous, cardiovascular and immune systems are studied. The laboratory sessions emphasize human anatomy using models and human cadavers. Dissections and physiological experiments are conducted.
Prerequisite: BIO 231 with grade "C" or better

BIO 233 - Human Anatomy/Physiology III
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Conclusion of the sequence in human anatomy and physiology. Digestive, respiratory, renal and reproductive systems are examined. Metabolism, human genetics and development are also studied. Laboratory sessions emphasize physiological experiments and human anatomy using models and human cadavers.
Prerequisite: BIO 232 with grade "C" or better

BIO 235 - Human Genetics
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Genetic concepts using human examples, including the molecular and cellular basis of inheritance, patterns of inheritance, basic pedigree analysis, mutation, single-gene and polygenic diseases, and an introduction to genetic biotechnology.
Prerequisite: BIO 233

BIO 247 - Forensic Anthropology
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
The morphological characteristics unique to the human skeleton that are used in establishing population demographics will be discussed and demonstrated. The laboratories are designed as hands-on experience applying the methodologies as presented in the lecture session.

BIO 307 - Seminar
Lecture Hours: 15
Lab Hours: 15
Credit Hours: 15
(Hours to be arranged each term.)

BIO 313 - Botany
Lecture Hours: 2
Lab Hours: 6
Credit Hours: 4
Introduction to classification and identification of vascular plants, emphasizing major plant families in California and Oregon; field and herbarium techniques. Weekend field trips required.
Prerequisites: BIO 211 and BIO 212

BIO 326 - Parasitology
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Parasitic infections of humans and animals (especially by protozoa and helminths). The course will cover parasite taxonomy, life cycles, epidemiology, clinical features, laboratory diagnosis, treatment and prevention. Students will practice various diagnostic techniques in the laboratory.
Prerequisite: BIO 105 or BIO 213 or BIO 233, or instructor consent

BIO 331 - Human Anatomy/Physiology I
Lecture Hours: 3
Lab Hours: 6
Credit Hours: 5
An in-depth systematic study of human anatomy and physiology of the integumentary, skeletal, and muscular systems. Laboratories include histology, examination of human bones, cadaver dissection, computer-aided physiology studies and other hands-on activities.
Prerequisites: BIO 213 and CHE 223, both with grade "C" or better
Pre- or Corequisite: BIO 200 or instructor consent

BIO 332 - Human Anatomy/Physiology II
Lecture Hours: 3
Lab Hours: 6
Credit Hours: 5
An in-depth systematic study of human anatomy and physiology of nervous, endocrine and cardiovascular systems. Laboratories will include histology, cadaver dissection, computer-aided physiology studies, and other hands-on activities.
Prerequisite: BIO 331 with grade "C" or better, or instructor consent

BIO 333 - Human Anatomy/Physiology III
Lecture Hours: 3
Lab Hours: 6
Credit Hours: 5
An in-depth systematic study of human anatomy and physiology of the lymphatic, respiratory, digestive, urinary and

reproductive systems and an overview of embryology. Laboratories will include histology, cadaver dissection, computer-aided physiology studies, and other hands-on activities.
Prerequisite: BIO 332 with grade "C" or better, or instructor consent

BIO 335 - Cross-Sectional Anatomy
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Cross-sectional anatomy correlated with computer tomography, ultrasonography, and magnetic resonance imaging.
Prerequisite: BIO 233

BIO 336 - Essentials of Pathophysiology
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Study of dynamic aspects of disease process with emphasis on abnormal physiology. Detailed discussion of cellular alterations, normal immunology, neoplasia, inflammation, and alterations of the respiratory and skeletal systems, and Diabetes Mellitus.
Prerequisites: BIO 200 and BIO 233

BIO 337 - Aquatic Ecology
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Lotic and lentic ecosystems, hydrologic principles, processes and patterns of development, abiotic-biotic interactions, aquatic organisms and trophic structures, nutrient cycles and eutrophication, effects of disturbance, bio assessment techniques, management and restoration case studies.
Prerequisite: BIO 212

BIO 341 - Medical Genetics
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Principles of heredity, chromosome mechanisms and molecular genetics applied to disease processes in humans. Review of case histories of selected inherited disorders. Discussion of genetic intervention therapies.
Prerequisite: BIO 213 or BIO 233 or instructor consent

BIO 342 - Cell Biology
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Organelle organization, protein sorting, cell signaling, cytoskeletal functions, cell division mechanics, and cell interactions in development and aging.
Prerequisite: BIO 211 and BIO 212 and BIO 213, or instructor consent

BIO 345 - Medical Microbiology
Lecture Hours: 4
Lab Hours: 3
Credit Hours: 5
Mechanisms of pathogenicity and virulence relating to disease-causing viruses, bacteria, fungi, and other microorganisms. Host-parasite relationships and immunology, microbial physiology and genetics. Laboratory procedures and identification of selected bacteria and parasites.
Prerequisite: BIO 213 or BIO 233 or instructor consent

BIO 346 - Pathophysiology I
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Study of the dynamic aspects of the disease process with emphasis on abnormal physiology. Detailed discussion of cellular alterations, normal and abnormal immunology, neoplasia, inflammation, arteriosclerosis, hypertension, cardiac and vascular diseases.
Prerequisites: BIO 200, and BIO 233 or BIO 333 with grade "C" or better, or instructor consent

BIO 347 - Pathophysiology II
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Study of the dynamic aspects of the disease process with emphasis on abnormal physiology. Detailed discussion of alterations of respiratory function, liver and digestive system, neurologic, urinary, musculoskeletal disorders, and Diabetes Mellitus.
Prerequisite: BIO 346 with grade "C" or better, or instructor consent

BIO 352 - Developmental Biology
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
This course will explore the developmental processes of selected invertebrate and vertebrate groups. The event of gametogenesis, fertilization, gastrulation, neurulation, and post-embryonic development will be discussed. The role of differential gene expression in developmental pathways will be covered.
Prerequisite: BIO 211 and BIO 212 and BIO 213, or instructor consent

BIO 354 - Environmental Health
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
A multidisciplinary exploration of Environmental Health across scales from local to global including the history of public health and infrastructure and linkages between air and water quality, environmental psychology, environmental justice, epidemiology, toxicology, food production, waste, genetics, and climate change.
Prerequisite: BIO 211 or BIO 212 or instructor consent

BIO 357 - Intro to Neuroscience
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
This is an introductory course covering the organization and function of the human nervous system to build a foundation of general knowledge in a neurobiology of such topics as sensory/motor systems, the brain and behaviors, the biological basis of brain development, and learning of memory.
Prerequisite: PSY 339
Pre- or Corequisite: BIO 232 or BIO 332

BIO 366 - Zoology
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Organismal and integrative approach to the study of animal functional morphology, ecological physiology, behavior and interactions, development and evolution.
Prerequisites: BIO 211 and BIO 212

BIO 367 - Plant Ecology
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Overview of plant ecology including physiology, populations, communities, and ecosystems. Some topics covered are unique to plants, such as photosynthesis, and other topics, not necessarily unique to plants, emphasize the distinctive ways that plants deal with their environments. Weekend field trip required.
Prerequisites: BIO 211 and BIO 212

BIO 375 - Cross Sectional Anatomy II
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Continuation of cross section anatomy not including in BIO 335. This course covers MR images of the joints of the wrist, elbow, shoulder, ankle, knee, hip, thorax, spine and arterial system form the arch of the aorta to the Circle of Willis, as demonstrated by MRA.
Prerequisite: BIO 233

BIO 377 - Wildlife Ecology
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Fundamental concepts and applied methods in the study of wildlife populations. Focus on study design, habitat, and animal movements. Develop skills in wildlife data analysis, animal capture, marking and remote tracking.
Prerequisites: BIO 211 and BIO 212

BIO 386 - Ornithology
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Introduction to avian evolution, biology, ecology, and behavior with lab emphasis on the avian field studies and identification of birds Oregon and the Klamath region and skills and concepts for careers in wildlife and natural resources.
Prerequisites: BIO 211 or BIO 212 or instructor consent

BIO 407 - Seminar
Lecture Hours: 15
Lab Hours: 15
Credit Hours: 15
(Hours to be arranged each term.)

BIO 409 - Crnt Rsch Tpcs in Med Sci II
Lecture Hours: 2
Lab Hours: 0
Credit Hours: 2
A continuation of BIO 209 covering topics in medicine focusing on global health issues, infectious and chronic diseases. Projects in medical literature research, understanding scientific paper format, preparing technical papers and presentations, and public speaking.
Prerequisite: BIO 209 or instructor consent

BIO 426 - Evolutionary Biology
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Principles of evolutionary science, including speciation, biogeography, biodiversity, population genetics, natural selection and coevolution.
Prerequisite: BIO 211 and BIO 212 and BIO 213, or instructor consent

BIO 434 - Data Analysis Methods
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Fundamental principles of data analysis from field projects, data archives, and other sources. Analysis of variance, hypothesis testing, random processes. Regression and times series analysis. Discussion and practice of data visualization and presentation techniques.

BIO 435 - Exercise Physiology
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Physiological response to single bouts of exercise and longer term training, considering resistance and aerobic exercise effects on metabolism, skeletal muscle, the cardiovascular system, and the respiratory system. Additional applications of exercise and training in performance and human health.
Prerequisite: BIO 233 or BIO 333 or instructor consent

BIO 436 - Immunology
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Cellular and humoral immunology including innate immunity, acquired immunity, antibodies, anatomy of immune response, production of effectors, adversarial strategies during infection, immunodeficiency, and transplantation.
Prerequisite: BIO 213 or BIO 233 or instructor consent

BIO 446 - Conservation Biology
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Study of global patterns and threats to biodiversity. In-depth focus on ecosystem services, habitat fragmentation, design of conservation reserves, conservation funding and politics, and understanding and communicating of climate change.
Prerequisites: BIO 211 and BIO 212

BIO 461 - Human Cadaver Dissection
Lecture Hours: 0
Lab Hours: 3
Credit Hours: 1
Study of human anatomy utilizing cadaver dissection. Attention will be given to three-dimensional relationships of structures, appreciation of textural differences, and development of palpation skills. Recognition of pathologic abnormalities and individual variations will be investigated.
Prerequisites: BIO 233 or BIO 333, and instructor consent

BIO 462 - Human Cadaver Dissection
Lecture Hours: 0
Lab Hours: 3
Credit Hours: 1
Study of human anatomy utilizing cadaver dissection. Attention will be given to three-dimensional relationships of structures, appreciation of textural differences, and development of palpation skills. Recognition of pathologic abnormalities and individual variations will be investigated.
Prerequisites: BIO 233 or BIO 333, and instructor consent

BIO 495 - Research Project in Biology
Lecture Hours: 0
Lab Hours: 0
Credit Hours: Varies (1-4)
Supports student-initiated research projects in biological sciences. Topic and scope must be reviewed and accepted by a faculty advisor. May be repeated for up to nine total credits.
Prerequisite: Instructor consent

Business

BUS 101 - Introduction to Business
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
An introductory course covering the basic aspects of business, marketing, management, production, accounting, and finance. Exploration of the various forms of business ownership. Examination of the role of business in the economy, and society. Discussion of cultural, ethical and current events, and trends affecting business. Exposure to the multiple career fields in the areas of business.

BUS 107 - Seminar
Lecture Hours: 15
Lab Hours: 15
Credit Hours: 15
(Hours to be arranged each term.)

BUS 207 - Seminar
Lecture Hours: 6
Lab Hours: 0
Credit Hours: 6
(Hours to be arranged each term.)

BUS 215 - Principles of Management
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Introduction to the history of management. Emphasis on the management functions of planning, organizing, directing and controlling; existing and emerging management theories, social responsibilities and business ethics. (Cannot be taken for graduation credit by students who have taken BUS 304 or BUS 317.)

BUS 223 - Marketing I
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Principles that drive the integration of the marketing mix (product, price, place, promotion) to meet the needs and wants of consumer and business markets. Function of market research and the study of market opportunities to grow and sustain organizations.

BUS 226 - Business Law
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
The fundamentals of business law: the structure of federal and state courts and agencies, their decision processes; the legal structure of modern business organizations including closely and publicly held corporations, partnerships, limited partnerships, nonprofit corporations, sole proprietorships and limited liability companies; contract law; Uniform Commercial Code; tort law and its implications for business; administration law; and criminal law as it applies to business and industry.

BUS 256 - Business Communications
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
Emphasis on effective content, structure, tone and visual format for both internal and external communication. Students will compose various commonly occurring business documents achieving effectiveness in design, organization, content, and style, applying current graphic design and visual-design principles.
Prerequisites: BUS 215 or BUS 223, and WRI 122

BUS 304 - Engineering Management
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
The engineering management process. The

unique aspects of managing 'knowledge workers.' The manager's role in planning, organizing, leading and controlling. Managing design and new products development, materials, and inventory. Organizational styles, structures, and policies. Human resource management for individuals and groups. (Cannot be taken for graduation credit by students who have taken BUS 215 or BUS 317.)
Prerequisite: Junior standing or instructor consent

BUS 307 - Seminar
Lecture Hours: 16
Lab Hours: 0
Credit Hours: 16
(Hours to be arranged each term.)

BUS 308 - Prin of International Business
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Introduction to international business fundamentals in the areas of cultural, ethical, legal and economic environments, international financial tools and instruments, international trade theory, manufacturing strategies, international supply chain management, country selection, exchange rate mechanics and international human resource management.
Prerequisite: WRI 121

BUS 309 - Introduction to Tourism
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Introduction to tourism industry. Topics include major components of tourism, service suppliers, travel, transportation, accommodations, food and beverage, attractions, entertainment, destinations, and impacts of tourism on society.

BUS 313 - Health Care Systems & Policy
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
This course will explore the U.S. Health System focusing on its historical development, current configuration and possibly future direction. Included will be the study of health system development, key influencers, accessibility, financers, employers, government and insurers. Particular attention will be paid to the future direction of healthcare and what parts of the system are likely to change.
Prerequisite: WRI 227

BUS 314 - Entrepreneurship I
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Complete a full business plan with marketing, financial and operational plan for new business venture. Students will learn and apply fundamental strategic decisions for small business entrepreneurs in all facets of starting, operating and growing a business.

BUS 316 - Total Quality Health Care
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
The health care quality management process, contemporary issues and trends involved with quality control, organization structures, policies, human factors and teamwork.
Prerequisite: Junior standing

BUS 317 - Health Care Management
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
The health care manager's role in planning, organizing, leading, and controlling. Special emphasis on the unique and complex issues involved in health care management. Organizational structures. Strategic and operational planning. Health care finance and budgeting. The future of management. (Cannot be taken for graduation credit by students who have taken BUS 215 or BUS 304.)
Prerequisite: WRI 121

BUS 318 - Marketing II
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Advanced study markets with a focus on the motivation and behavioral characteristics of consumers. Study and apply analytics, technology and data-driven decision making in the formation of a customer-centered marketing and marketing communication strategy.
Prerequisites: BUS 223 and PSY 201

BUS 319 - Integrated Marketing Comm.
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Integrated marketing communication promotion mixes and strategies, tactics and media to influence buyer behavior and brand equity with various markets. Application of marketing communication tools through the development of a promotional campaign with goals, core themes, designs, budgets and specifications.
Prerequisite: BUS 223 or BUS 337

BUS 325 - Finance Management
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Basic issues and methodology of financial management. Emphasis placed on working capital management, sources of short-term and long-term funds, and optimal capitalization of the firm.
Prerequisites: BUS 215 and ACC 203

BUS 326 - Sales/Sales Management
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Fundamentals of selling products and services and sales management in various markets, buying behavior and processes, adaptive selling skills, establishing and selling the value proposition, role playing and sales simulations, after sale considerations and review of customer relationship management systems.
Prerequisites: ACC 201 and BUS 223

BUS 328 - Health Care Accounting/Finance
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
General principles and application of managerial accounting in health care organizations. Theory and procedure in gathering cost data and their use in analyzing and controlling operation costs: job-order and process-cost systems. Revenue cycle, sources and system analysis of variance, cost effectiveness and managerial reporting are examined.
Prerequisite: ACC 201

BUS 331 - Personal Finance
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Introduction to the basic principles of personal financial planning and budgeting. Includes banking services, consumer credit, asset purchases, insurance, and the fundamentals of investments and retirement planning.

BUS 335 - Entrepreneurship II
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Start-up concepts and models, identification and assessment of the critical factors that lead to a successful start-up. Focus on small business idea generation and the analysis of market opportunities in B2C and B2B markets. Conduct a market and financial feasibility study.

BUS 337 - Prin of Health Care Marketing
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Fundamentals of health care marketing covering strategy, planning process, assessment, marketing actions, branding and evaluation.

BUS 345 - Fraud Examination
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Study of fraud and fraud investigative techniques. Topics include nature of fraud, types of fraud, fraud prevention, detection and investigation methods, and legal follow-up procedures.

BUS 347 - Geography of Travel/Tourism
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Study of those destinations around the world that are most important to travelers including the World-Heritage sites. Topics

include fundamentals of geography, both physical and cultural, and major tourism destinations.

BUS 349 - Human Resource Management I
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Principles, theories and applications of HR management in the areas of strategy, workforce planning, employment law, job analysis, recruitment, selection, training, performance management and international HRM.
Prerequisite: BUS 215 or BUS 304 or BUS 317 or instructor consent

BUS 350 - Hospitality Management
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Study of management principles in the tourism and hospitality industry. Topics include managing growth and change in the hospitality industry, major functional areas in hotels and restaurants and the economic aspects of the industry.

BUS 356 - Business Presentations
Lecture Hours: 3
Lab Hours: 4
Credit Hours: 4
Design, preparation and delivery of effective business presentations. Emphasis on integration of skills in speech and digital communication software to deliver effective, informative and persuasive presentations in any business or organization.
Prerequisites: SPE 111 and WRI 122

BUS 358 - Marketing Hospitality/Tourism
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Study of marketing principles as they apply to the tourism and hospitality industry. Topics include marketing in strategic planning, the marketing environment, marketing information systems and marketing research, consumer buying behavior, market segmentation, product pricing, distribution channels, and internet marketing. (Cannot be taken for graduation credit by students who have taken BUS 399 Special Topics: Marketing Tourism).

BUS 385 - Ecotourism
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Study of sustainability principles as they apply to the tourism and hospitality industry. Topics include the ecotourism environment, the economic, sociological and cultural impacts of ecotourism, ecotourism as a business, and a world survey of ecotourism sites.
Prerequisite: WRI 121

BUS 387 - International Human Res Mgmt
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
In-depth review of human resource selection, training for international assignments, managing the expatriate manager, compensation packages, repatriation training, women and dual-career couples, conflicting interests of parent company and host country and managing joint ventures.
Prerequisite: BUS 308

BUS 390 - Applied Management Internship
Lecture Hours: 0
Lab Hours: 9
Credit Hours: 3
This course provides credit for an approved internship related to the student's program. Students work in a supervised setting where they receive training to develop career related skills while applying college learned theory.
Prerequisite: Instructor consent

BUS 397 - Human Resource Management II
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Principles, theories, and applications of HR management in the areas of compensation, benefits, safety, labor relations, employee rights and engagement.
Prerequisite: BUS 349

BUS 399 - Marketing Special Topics
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Concentrated areas of marketing will be taught on a rotating basis: business to business, hospitality and travel, entertainment and sports, high tech, direct marketing and public relations.
Prerequisite: BUS 223

BUS 405 - Reading and Conference
Lecture Hours: 6
Lab Hours: 0
Credit Hours: 6
(Hours to be arranged each term.)

BUS 407 - Seminar
Lecture Hours: 15
Lab Hours: 0
Credit Hours: 15
(Hours to be arranged each term.)

BUS 414 - Marketing Research
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Introduction to the research function as it applies to marketing. Research methodology, design, surveys, data collection, interpretation and recommendations.
Prerequisites: MATH 361 and WRI 227

BUS 415 - Environmental Regulation
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Legislation and enforcement activities involving natural and industrial environments. Conservation laws, land use and planning, responsibilities of regulatory agencies, review of current legislative actions and judicial decisions.
Prerequisite: BIO 112 or BUS 226

BUS 416 - Environmental Management
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Review of contemporary management issues and business practices related to land use management and planning, ecological planning, environmental quality engineering and control, and natural resource economics.
Prerequisites: BUS 415, and ECO 201 or BIO 112

BUS 420 - Applied Management Internship
Lecture Hours: 0
Lab Hours: 9
Credit Hours: 3
This course provides credit for an approved internship related to the student's program. Students work in a supervised setting where they receive training to develop career related skills while applying college learned theory. This course can substitute for BUS 496.
Prerequisite: Instructor consent

BUS 434 - Global Marketing
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Comprehensive study of global business issues that develop strategic visions for market entry in emerging and developed countries, analyzing financial and pricing considerations, evaluating strategies of export versus local manufacturing, developing a marketing program that demonstrates implementation of global business principles.
Prerequisites: BUS 223 and BUS 308

BUS 435 - Marketing III
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Management marketing strategies within a marketing centric business or organization, including the development of new products and services in response to market demands. Development of collaborative strategies in distribution, pricing and product/service mixes for new products, services and line extensions.
Prerequisite: BUS 318

BUS 441 - Leadership I
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3

Role of managers and leaders within an organization. Recognizing styles, competencies and traits of a leader and strategic application within a working environment through case analysis and discussion, introduction and development of personal leadership skills.
Prerequisite: BUS 215 or BUS 304 or BUS 317

BUS 442 - Leadership II
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Leadership in developing and communicating vision/mission and values setting ethical standards. Leading and developing multi-levels of managers. Mentoring high potential managers and transformational leaders. Leadership during conflict, change and diversity. The role of the leader in organizational development.
Prerequisite: BUS 441

BUS 447 - Controversial Issues in Mgmt
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Examination of the many controversial issues in management such as social responsibility, whistle blowing, outsourcing, drug testing, Affirmative Action and so on. Students will study opposing views and arguments from a variety of viewpoints. Discussion and debate develops critical thinking skills.
Prerequisites: BUS 215, BUS 304 or BUS 317, PSY 347, WRI 122, and Junior standing

BUS 456 - Business Research Methods
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Research design, exploration, and proposals. Hypotheses formulation and testing. Data sources, collection and analysis. Survey design, sampling and census techniques. Library and on-line information retrieval sources. Effective search strategies.
Prerequisites: BUS 215 or BUS 304 or BUS 317, and MATH 243 or MATH 361

BUS 457 - Business Research Methods II
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Emphasizes quantitative elements of research methods including presenting and describing information, drawing conclusions about populations using sample information; and improving business processes.
Prerequisites: BUS 215 or BUS 304 or BUS 317, and MATH 243 or MATH 361

BUS 467 - Service Management
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
The nature of service and service encounters, strategy, and competitiveness. Design of service systems. Facilities location, design, and layout. Service quality and continuous improvement.
Prerequisite: BUS 215 or BUS 304 or BUS 317

BUS 473 - Marketing Plan Development
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Development of an in-depth marketing plan for a local community business. All aspects of the plan will be covered in detail.
Prerequisites: BUS 223 and BUS 319

BUS 478 - Strategic Management
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Comprehensive study and analysis of businesses and/or case studies. Evaluation of strategic and operational decision-making. Performance analysis in areas of finance, marketing and social performance.
Prerequisites: ACC 203, WRI 227, and Senior standing

BUS 495 - Senior Project Proposal
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Examination of senior internship and/or project process and requirements. Definitions of a suitable senior internship or project topic and preparation of a formal proposal. Topics dealing with client contact, task definition, privacy and confidentiality, initial research, presentation of results.
Pre- or Corequisites: BUS 456 or BUS 457, and MGT 335

BUS 496 - Senior Project
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Students finalize project plan and complete data gathering and analysis portion of a project for a client or an independent research project. Topics include completing research, data gathering and analysis. Interim project report is written.
Prerequisite: BUS 495 with grade “C” or better

BUS 497 - Senior Project
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Students complete project started in BUS 496 including preparing a detailed project report and delivering a final PowerPoint presentation. Periodic progress reports required. Instructor functions as a consultant.
Prerequisite: BUS 496 with grade of "C" or better
Pre- or Corequisite: BUS 356

BUS 507 - Seminar
Lecture Hours: 0
Lab Hours: 0
Credit Hours: 15
(Hours to be arranged each term.)

BUS 525 - Marketing Management
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Topics include concepts related to the marketing management function of segmentation, brand equity, customer value analysis, integrated marketing, internal marketing and various organizational roles in moving a firms' products or services to end-users profitability and with value to the customers.

Civil Engineering

CE 107 - Seminar
Lecture Hours: 6
Lab Hours: 6
Credit Hours: 6
(Hours to be arranged each term.)

CE 203 - Engineering Graphics
Lecture Hours: 1
Lab Hours: 6
Credit Hours: 3
Graphical communication in civil engineering using computer-aided drafting and design software. Includes development of drawings related to civil engineering projects such as roads, subdivisions and buildings, development of scaled plots and reading of engineering drawings.

CE 205 - Computational Methods
Lecture Hours: 2
Lab Hours: 0
Credit Hours: 2
Solve applied problems involving formulas, functions, summation and iteration using Excel and VBA. Use built-in functions and graphing capabilities.
Prerequisite: MATH 112 with grade "C" or better

CE 207 - Seminar
Lecture Hours: 6
Lab Hours: 0
Credit Hours: 6
(Hours to be arranged each term.)

CE 208 - Princ of Professional Practice
Lecture Hours: 4
Lab Hours: 0
Credit Hours: 4
Civil engineering professional practice topics including project acquisition, development, management and delivery. Business in civil engineering including ethics, economics, leadership, communication and legal matters, current and emerging trends in practice.

CE 212 - Civil Engineering Materials
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Study of the engineering properties of soil as well as Portland cement and asphaltic concretes. Field and laboratory testing

methods for classifying soil. Mix design of concretes.
Prerequisites: ENGR 102 and MATH 111, both with grade "C" or better

CE 299 - Independent Studies
Lecture Hours: 15
Lab Hours: 15
Credit Hours: 15
(Hours to be arranged each term.)

CE 307 - Seminar
Lecture Hours: 15
Lab Hours: 15
Credit Hours: 15
(Hours to be arranged each term.)

CE 308 - Princ of Professional Practice
Lecture Hours: 4
Lab Hours: 0
Credit Hours: 4
Civil engineering professional practice topics including project acquisition, development, management and delivery. Business in civil engineering including ethics, economics, leadership, communication and legal matters. Current and emerging trends in practice.
Prerequisites: ENGR 102 and MATH 111, both with grade "C" or better

CE 311 - Intro to Geotechnical Engr
Lecture Hours: 4
Lab Hours: 3
Credit Hours: 5
Soil permeability, seepage, filters, effective stress, consolidation, settlement, shear strength, slope stability, stresses in soils, and stresses under loaded areas. Includes laboratory testing.
Corequisite: CE 212 with grade "C" or better

CE 312 - Earth Pressures & Foundations
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Analysis and design of shallow footings, deep foundations include piles, caissons and earth retaining structures design. Use of computer applications for design of these structures.
Prerequisite: CE 311 with grade "C" or better

CE 331 - Structural Analysis
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Structural loads according to ASCE 7. Analysis of statically determinate trusses and frames. Shear and moment diagrams, deflections, and influence lines for statically determinate structures. Analysis of statically indeterminate structures by force and displacement methods. Software applications emphasized in labs.
Prerequisite: ENGR 213 with grade "C" or better

CE 341 - Elementary Structural Design
Lecture Hours: 4
Lab Hours: 3
Credit Hours: 5
Fundamentals of structural element design: emphasis on structural steel, reinforced concrete, and timber beams and short columns as well as reinforced masonry lintels and walls due to gravity loads. Labs include construction, material and destructive testing, and software applications.
Prerequisite: CE 331 with grade "C" or better

CE 351 - Intro to Transportation Engr
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Introduction to the design, planning, operation, management and maintenance of transportation systems with a focus on the highway and railway modes. Principles of planning multi-modal transportation systems, layout of roadways, traffic flow modeling and capacity analyses.
Prerequisites: ENGR 211 and GME 161, both with grade "C" or better

CE 354 - Traffic Engineering
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
Principles of traffic engineering and operation, traffic engineering studies, signalized intersection design, traffic analysis software.
Prerequisite: CE 351 with grade "C" or better

CE 371 - Closed Conduit Design
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Population and factors influencing water supply demands, fire flows, peaking factors and storage requirements. Flows in pressure pipe systems, pipe networks analysis and design techniques. Estimation of wastewater flows including I/I considerations. Gravity-fed collection system design, construction and maintenance.
Prerequisite: ENGR 318 with grade "C" or better

CE 374 - Hydrology
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Study of the hydrologic cycle, measurement of rainfall, runoff and streamflow. Curve fitting, hydrographic analysis, statistical analyses of extreme flows, flood routing and storage capacity. Runoff modeling and design of hydrologic structures and systems.
Prerequisite: CE 371 with grade "C" or better
Corequisite: MATH 361

CE 401 - Civil Engineering Project I
Lecture Hours: 3
Lab Hours: 6
Credit Hours: 2
First term of a two-term sequence integrating civil engineering design, group dynamics and technical communications. Students receive two credit hours in civil engineering (CE 401) and three credit hours in communication for general education (COM 401).
Prerequisites: WRI 227 and advisor consent

CE 402 - Civil Engineering Project II
Lecture Hours: 5
Lab Hours: 6
Credit Hours: 4
Second term of a two-term sequence integrating civil engineering design, group dynamics and technical communications. Students receive four credit hours in civil engineering (CE 402) and three credit hours in communication for general education (COM 402).
Prerequisites: CE 401 and COM 401, both with grade "C" or better
Corequisite: SPE 321

CE 403 - FE Exam Preparation
Lecture Hours: 0
Lab Hours: 3
Credit Hours: 1
Lectures and problem work sessions to help civil engineering students successfully pass the fundamentals of engineering (FE) exam. Topics covered include mathematics, ethics, economics, statics, dynamics, solid mechanics, materials, fluid mechanics, hydraulics, hydrologic systems, structures, geotechnical, transportation, environmental, construction, and surveying.
Corequisite: CE 402

CE 405 - Sustainability & Infrastruct
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Integrating sustainability concepts and key social, economic and environmental issues and processes relevant to civil engineering. Sustainable design practices in each civil engineering sub-discipline will be studied and existing and proposed infrastructure projects will be evaluated.
Corequisite: CE 401

CE 407 - Seminar
Lecture Hours: 12
Lab Hours: 12
Credit Hours: 12
(Hours to be arranged each term.)

CE 408 - Workshop
Lecture Hours: 0
Lab Hours: 0
Credit Hours: 0
(Hours to be arranged each term.)

CE 411 - Engineering Geology
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
A study of the interaction of geology, including structure, geologic processes (current and historic), lithology and

mineralogy with civil engineering structures.
Prerequisites: CE 311 and GEOL 201, both with grade "C" or better

CE 413 - Advanced Soils
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
Advanced laboratory and in situ techniques for characterizing soils for use in civil engineering applications.
Prerequisites: CE 311 and GEOL 201, both with grade "C" or better

CE 421 - Seepage & Earth Structures
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Covers material related to analyzing steady state and transient seepage conditions, erosion and piping, and the stability of earth slopes and embankments.
Prerequisites: CE 311, CE 312, and GEOL 201, all with grade "C" or better

CE 422 - Adv Shear Strength of Soils
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
This course is designed to give students an advanced understanding of the shear strength of soils including drained and undrained strength of fine and course grained soils.
Prerequisites: CE 311 and GEOL 201, both with grade of "C" or better

CE 423 - Deep Foundations
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
This course covers the design of deep foundation systems including driven piles and drilled shafts. These systems are designed for axial and lateral loading.
Prerequisites: CE 311, CE 312, and GEOL 201, all with grade "C" or better

CE 432 - Struc Loading & Lat. Forces
Lecture Hours: 4
Lab Hours: 0
Credit Hours: 4
Gravity loads (dead, live, roof live, and snow) and lateral loads (wind and seismic) according to ASCE 7 and Oregon Structural Specialty Cod. Introduction and design of basic lateral force resisting systems and gravity elements with software applications as appropriate.
Prerequisite: CE 341 with grade "C" or better

CE 433 - Structural Matrix Analysis
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
Static analysis of determinate and indeterminate structures using the direct stiffness method with heavy emphasis on computer models and solutions. Students will design and develop their own structural analysis program.
Prerequisite: CE 331 with grade "C" or better

CE 439 - Highway Bridge Rating
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
Introduction to bridge types, bridge design philosophies and bridge rating procedures. Load rating of short-span highway bridges using AASHTO provisions and ODOT procedures. Software applications.
Prerequisite: CE 341 with grade "C" or better

CE 442 - Adv Reinforced Concrete Design
Lecture Hours: 4
Lab Hours: 0
Credit Hours: 4
Design, analysis, and detailing of reinforced concrete elements, including: T-beams, doubly-reinforced beams, continuous beams, shear walls, slender columns, slabs, footings, and moment frames. Seismic resistance and the development, anchorage, and splicing of steel reinforcement are introduced.
Prerequisite: CE 341

CE 444 - Intermediate Steel Design
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Design of structural steel tension members, frameworks, composite beams, and bolted and welded connections. Application of the AISC Steel Construction Manual structural stability provisions and software applications.
Prerequisite: CE 341 with grade "C" or better

CE 447 - Masonry Design
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Analysis and design of masonry beams, walls and columns using computer solutions with emphasis on lateral design considerations.
Prerequisites: CE 341 with grade "C" or better, and gravity elements with software applications as appropriate

CE 448 - Timber Design
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Analysis and design of simple (determinate) timber beams, columns, trusses and connections using dimensioned lumber, plywood and laminated members, with an emphasis on lateral force design. Computer solutions introduced.
Prerequisite: CE 341 with grade "C" or better

CE 449 - Bridge Design
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Design and analysis of short and medium-span highway bridge superstructures including reinforced concrete, slab bridges, steel deck girder bridges, and prestressed concrete bridges. Software applications.
Prerequisite: CE 341 with grade "C" or better

CE 450 - Transportation Structures
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
Design and analysis of common transportation structures including culverts, sign structures, light poles, and railings according to current AASHTO provisions and ODOT procedures. Software applications.
Prerequisite: CE 341 with grade "C" or better

CE 456 - Pavement Engineering
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
Hot mixed asphalt materials testing and mixture design. Methods of manufacture, transport, and placement of rigid and flexible pavements. Structural design of rigid and flexible pavements. Pavement rehabilitation and management.
Prerequisites: CE 212, CE 351, and ENGR 213, all with grade "C" or better

CE 457 - Transportation & Land Dev.
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
Study of interactions between land development activity and the transportation network. Application of planning and engineering design techniques to manage the impacts of development upon the transportation system.
Prerequisite: CE 354 with grade "C" or better

CE 458 - Transportation Safety
Lecture Hours: 4
Lab Hours: 0
Credit Hours: 4
Safety concepts in highway engineering including highway design, operation, and maintenance, as well as human factors, statistical analysis, traffic control and public policy. Design concepts of intersections, interchanges, signals, signs and pavement markings.
Prerequisite: CE 354 with grade "C" or better

CE 468 - Travel Demand Modeling
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Introduction to travel demand analysis and forecasting. Models studied from a theoretical, applied and practical perspective. Students will become familiar with the traditional four-step travel forecasting process, including model

development, application and interpretation of outputs.
Prerequisite: CE 351 with grade "C" or better

CE 472 - Hydrometry
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
Measurement of variables in the hydrologic cycle. Principles, methods, instruments, and equipment for obtaining surface and ground water quantity and quality data in nature to support design and water management efforts.
Prerequisite: CE 374 with grade "C" or better

CE 473 - Groundwater
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Offers an introduction to the physical properties and principles of groundwater. Topics include groundwater and the hydrologic cycle, fundamental fluid flow laws, groundwater resource evaluation, and groundwater contamination.
Prerequisite: CE 311 with grade "C" or better

CE 476 - Applied Hydraulic Design
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
Flow analysis for constructed channels; principles of hydraulic design of culverts, bridge waterway openings, highway inlets, rundowns, and appurtenant water control structures. Computer modeling of bridge and culvert hydraulics. Design of appropriate Best Management Practices (BMPs) for storm water quality and erosion control. Design project.
Prerequisite: CE 374 with grade "C" or better

CE 481 - Environmental Engineering I
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Introduction to environmental engineering principles, fundamental concepts and supporting calculations. Physical, chemical and biological elements of the natural environment. Environmental impacts of anthropogenic activities. Control and pollution prevention technologies. Legal and regulatory framework governing environmental management.
Prerequisites: CHE 221 and ENGR 318, both with grade "C" or better

CE 489 - Treatment Wetlands
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Treatment wetland features; biological, chemical, and physical properties. Planning, design, and performance assessment principles for municipal, agricultural and storm water treatment wetlands. Considers vegetation and microbiology, aerobic and anaerobic biogeochemistry, hydraulics and treatment efficiencies. Local case studies.
Prerequisites: CHE 221 and ENGR 318, both with grade "C" or better

CE 499 - Independent Studies
Lecture Hours: 0
Lab Hours: 0
Credit Hours: 15
(Hours to be arranged each term.)

CE 501 - Civil Engr Graduate Seminar
Lecture Hours: 1
Lab Hours: 0
Credit Hours: 1
Civil Engineering graduate students will meet regularly with faculty members to share progress on their graduate project selection and report writing.
Prerequisite: Advisor consent

CE 507 - Seminar
Lecture Hours: 9
Lab Hours: 9
Credit Hours: 9
(Hours to be arranged each term.)

CE 511 - Seepage and Earth Structures
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Covers material related to analyzing steady state and transient seepage conditions, erosion and piping, and the stability of earth slopes and embankments.
Prerequisites: CE 311, CE 312, and GEOL 201, all with grade "C" or better

CE 512 - Earthquake Engineering
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
This course describes basic earthquake engineering in terms of regional seismicity, predicted ground motions, probabilistic methods for seismic analysis, liquefaction and steady-state shear strength analysis.
Prerequisites: CE 311 and GEOL 201, both with grade "C" or better

CE 513 - Deep Foundations
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
This course covers the design of deep foundation systems including driven piles and drilled shafts. These systems are designed for both axial and lateral loading.
Prerequisites: CE 311, CE 312, and GEOL 201, all with grade "C" or better

CE 522 - Adv Shear Strengths of Soils
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
This course is designed to give students an advanced understanding of the shear strength of soils including drained and undrained strength of fine and coarse grained soils.
Prerequisites: CE 311 and GEOL 201, both with grade "C" or better

CE 533 - Structural Matrix Analysis
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
Static analysis of determinate and indeterminate structures using the direct stiffness method with heavy emphasis on computer models and solutions. Students will design and develop their own structural analysis program.
Prerequisite: CE 331 with grade "C" or better

CE 534 - Advanced Solid Mechanics
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Three-dimensional stress and strain, failure theories, elasticity and plasticity, curved beams, beams on elastic foundations, unsymmetric bending and shear centers.
Prerequisite: CE 442 or CE 444 with grade "C" or better

CE 535 - Structural Dynamics
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
Analysis of single degree of freedom structural systems to harmonic and general dynamic loading. Free vibrating and forced vibration of multiple degree of freedom systems, modal superposition, earthquake engineering, current IBC methods.
Prerequisite: CE 331 with grade "C" or better

CE 539 - Highway Bridge Rating
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
Introduction to bridge types, bridge design philosophies and bridge rating procedures. Load rating of short-span highway bridges using AASHTO provisions and ODOT procedures. Software applications.
Prerequisite: CE 341 with grade "C" or better

CE 542 - Prestressed Concrete Design
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Analysis, behavior, and design of prestressed concrete structures and elements including beams, composite beams, box-girders and flanged beams, continuous beams and indeterminate frames, slabs, and compression members. Precast member design and behavior also introduced.
Prerequisite: CE 442 with grade "C" or better

CE 544 - Advanced Steel Design
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Torsion members, plate girders, and lateral force resisting systems. AISC Seismic

Provisions for Structural Provisions for Structural Steel Buildings. Advanced topics in structural stability and connection design.
Prerequisite: CE 444 with grade "C" or better

CE 549 - Bridge Design
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Design and analysis and short and medium-span highway bridge superstructures including reinforced concrete slab bridges, steel deck girder bridges, and prestressed concrete girder bridges. Software applications.
Prerequisite: CE 341 with grade "C" or better

CE 550 - Transportation Structures
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
Design and analysis of common transportation structures including culverts, sign structures, light poles, and railings according to current AASHTO provisions and ODOT procedures. Software applications.
Prerequisite: CE 341 with grade "C" or better

CE 551 - Geometric Design of Roadways
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
This course will provide students with an understanding of the principles and techniques of highway design. Topics include laying out potential routes, design of the alignment and intersections, evaluation of earthwork requirements, and safety considerations.
Prerequisite: CE 354 with grade "C" or better

CE 554 - Advanced Traffic Engineering
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
Traffic studies including volume, speed, travel time and delay. Freeway and rural highway facility design, signing and marking. Urban unsignalized and signalized intersection design. Arterial planning and design.
Prerequisite: CE 354 with grade "C" or better

CE 556 - Advanced Pavement Design
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
This course covers advanced topics in the design and analysis of pavement materials and structures.
Prerequisite: CE 456 with grade "C" or better

CE 558 - Transportation Safety
Lecture Hours: 4
Lab Hours: 0
Credit Hours: 4
Safety concepts in highway engineering including highway design, operation, and maintenance, as well as human factors statistical analysis, traffic control and public policy. Design concepts of intersections, interchanges, signals, and pavement markings.
Prerequisite: CE 354 with grade "C" or better

CE 568 - Travel Demand Modeling
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Introduction to travel demand analysis and forecasting. Models studied from a theoretical, applied and practical perspective. Students will become familiar with the traditional four-step travel forecasting process, including model development, application and interpretation of outputs.
Prerequisite: CE 351 with grade "C" or better

CE 571 - Open-Channel Hydraulics
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Application of basic principles of hydraulics to open channel flow. Theory and analysis of critical, uniform, unsteady, and gradually and rapidly varied flow. Flow characteristics in natural and constructed channels. Computer modeling of open-channel flow systems. Floodplain delineation methods.
Prerequisite: CE 371 with grade "C" or better

CE 572 - Hydrometry
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
Measurement of variables in the hydrologic cycle. Principles methods, instruments, and equipment for obtaining surface and ground water quantity and quality data in nature to support design and water management efforts.
Prerequisite: CE 374 with grade "C" or better

CE 574 - Environmental River Mechanics
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
River response to watershed modification and infrastructure, including introduction to fluvial geomorphology, sediment transport and stream restoration. Management of waterways and floodplains.
Prerequisite: CE 374 with grade "C" or better

CE 576 - Applied Hydraulic Design
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
Flow analysis for constructed channels; principles of hydraulic design of culverts, bridge waterway openings, highway inlets, rundowns, and appurtenant water control structures. Computer modeling of bridge and culvert hydraulics. Design of appropriate Best Management Practices (BMPs) for storm water quality and erosion control. Design project.
Prerequisite: CE 374 with grade "C" or better

CE 586 - Water & Wastewater Treatment
Lecture Hours: 4
Lab Hours: 0
Credit Hours: 4
Water and wastewater characteristics, chemistry, quality and supply. Engineering design and water demand projection. Theory of individual treatment processes, design guidelines for components for water/wastewater treatment.
Prerequisites: CE 371 and CHE 221, both with grade "C" or better

CE 587 - Environmental Remediation Tech
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Potential human activity effects on natural systems (air, soil, water). Physical, chemical, and biological processes in contaminant fate and transport. Regulatory aspects of environmental assessment, monitoring, and prioritization. Remediation/restoration technologies and strategies.
Prerequisite: CE 481 with grade "C" or better

CE 590 - Civil Engineering Grad Project
Lecture Hours: 0
Lab Hours: 0
Credit Hours: 9
Research and preparation pertaining to the master's project.
Prerequisite: Advisor consent

CE 595 - Graduate Thesis
Lecture Hours: 0
Lab Hours: 0
Credit Hours: Varies (1-6)
Research and preparation pertaining to the master's thesis.
Prerequisite: Advisor consent

Chemistry

CHE 101 - Intro to General Chemistry
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
A brief presentation of introductory chemical concepts including atomic structure, the chemical equation, the behavior of gases, the chemistry of solution, and acid-base chemistry. For students with good knowledge of algebra.
Corequisite: CHE 104 (lab)
Pre- or Corequisite: MATH 100

CHE 102 - Intro to Organic Chemistry
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
A continuation of CHE 101 with emphasis on organic chemistry. The role of organic chemistry in life and industrial processes is discussed.
Prerequisite: CHE 101 with grade "C" or better or instructor consent
Corequisite: CHE 105 (lab)

CHE 103 - Intro to Biochemistry
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
A continuation of CHE 102 with emphasis on biochemistry. The organic chemistry of biochemicals including proteins, carbohydrates, and fats, as well as nucleic acids is discussed. Basic elements of metabolism are also explored.
Prerequisite: CHE 102 with grade "C" or better or instructor consent
Corequisite: CHE 106 (lab)

CHE 104 - Intro to General Chemistry Lab
Lecture Hours: 0
Lab Hours: 3
Credit Hours: 1
Lab accompanying class content in CHE 101.
Corequisite: CHE 101

CHE 105 - Intro to Organic Chemistry Lab
Lecture Hours: 0
Lab Hours: 3
Credit Hours: 1
Lab accompanying class content in CHE 102.
Corequisite: CHE 102

CHE 106 - Elementary Chemistry Lab
Lecture Hours: 0
Lab Hours: 3
Credit Hours: 1
Lab accompanying class content in CHE 103.
Corequisite: CHE 103

CHE 107 - Seminar
Lecture Hours: 0
Lab Hours: 0
Credit Hours: 15
(Hours to be arranged each term.)

CHE 201 - General Chemistry I
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Atomic structure, chemical compounds, chemical equations and reaction stoichiometry, reactions in aqueous solutions (including acid/base, redox, and precipitation reactions) gas laws and kinetic-molecular theory, and thermochemistry. Emphasis on engineering applications.
Prerequisite: CHE 101 and CHE 104, or high school chemistry or equivalent
Corequisite: CHE 204 (lab)
Pre- or Corequisite: MATH 111

CHE 202 - General Chemistry II
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Electronic structure of atoms, periodic trends, chemical bonding, molecular geometry, intermolecular forces, phase transitions, and properties of solutions. Emphasis on engineering applications.
Prerequisite: CHE 201 and CHE 204, or CHE 221
Corequisite: CHE 205 (lab)

CHE 203 - General Chemistry III
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Chemical kinetics and equilibrium, applications of aqueous equilibria (including acid-base reactions, buffers, solubility, and complexation reactions), thermodynamics, entropy and free energy, electrochemistry, and nuclear chemistry.
Prerequisite: CHE 202 and CHE 205, or CHE 222
Corequisite: CHE 206 (lab)

CHE 204 - General Chemistry I Lab
Lecture Hours: 0
Lab Hours: 3
Credit Hours: 1
Lab accompanying class content in CHE 201.
Corequisite: CHE 201

CHE 205 - General Chemistry II Lab
Lecture Hours: 0
Lab Hours: 3
Credit Hours: 1
Lab accompanying class content in CHE 202.
Corequisite: CHE 202

CHE 206 - General Chemistry III Lab
Lecture Hours: 0
Lab Hours: 3
Credit Hours: 1
Lab accompanying class content in CHE 203.
Corequisite: CHE 203

CHE 207 - Seminar
Lecture Hours: 6
Lab Hours: 0
Credit Hours: 6
(Hours to be arranged each term.)

CHE 210 - Clinical Pharmacology
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
The drug action of selected pharmaceutical. Emphasis is placed on drug interactions, routes of administration, and effects on body systems.
Prerequisites: BIO 231 and BIO 232

CHE 221 - General Chemistry I
Lecture Hours: 4
Lab Hours: 3
Credit Hours: 5
Atomic structure, chemical compounds, chemical equations and reaction stoichiometry, reactions in aqueous solution (including acid/base, redox, and precipitation reactions), gas laws and kinetic-molecular theory, and thermochemistry. Includes lab component.
Prerequisite: CHE 101 and CHE 104, or high school chemistry or equivalent
Pre- or Corequisite: MATH 111

CHE 222 - General Chemistry II
Lecture Hours: 4
Lab Hours: 3
Credit Hours: 5
Electronic structure of atoms, periodic trends, chemical bonding, molecular geometry, intermolecular forces, phase transitions, and properties of solutions. Includes lab component.
Prerequisite: CHE 201 and CHE 204, or CHE 221

CHE 223 - General Chemistry III
Lecture Hours: 4
Lab Hours: 3
Credit Hours: 5
Chemical kinetics and equilibrium, applications of aqueous equilibria (including acid-base reactions, buffers, solubility, and complexation reactions), thermodynamics, entropy and free energy, electro chemistry, and nuclear chemistry. Includes lab component.
Prerequisite: CHE 202 and CHE 205, or CHE 222

CHE 260 - Electrochemistry for RE Applic
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Development of electrochemistry concepts, including thermodynamics, reaction kinetics, charge transport and mass transport. Topics are presented in the context of fuel cells, electrolysis, electroplating and batteries. Also discussed, the chemistry of hydrogen; its properties, production, storage and transportation.
Prerequisite: CHE 202 and CHE 205, or CHE 222

CHE 305 - Nanoscience & Nanotech
Lecture Hours: 4
Lab Hours: 0
Credit Hours: 4
Survey of chemical and physical phenomena as applied to nanoscale materials, including metal and semiconductor nanoparticles and carbon nanostructures. Discussion of major synthesis and characterization techniques. Biological and engineering applications of nanoscale materials.
Prerequisites: CHE 202 and CHE 205, or CHE 222, and PHY 222 or PHY 223

CHE 307 - Seminar
Lecture Hours: 0
Lab Hours: 0
Credit Hours: 15
(Hours to be arranged each term.)

CHE 315 - Environmental Analytical Chemistry
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Analysis of chemicals in the environment, including appropriate techniques and instrumentation for each environmental compartment (i.e. water, soil, and air). Chemical reactions/transformations within each compartment including concerns about containments, and effects of pollutants. Relative statistics and analytical techniques presented.
Prerequisite: CHE 233 or instructor consent

CHE 325 - Soil Science
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Nature, properties and distribution of soils and their relationship to the influence of vegetation, climate, landforms, and human activity. Understanding how soils form and how and why they vary horizontally across the landscape and vertically with depth. Emphasis upon North American patterns. Required field trips and labs.

CHE 331 - Organic Chemistry I
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
The structures and reactions of carbon compounds with emphasis on thermodynamics, reaction pathways and spectroscopy.
Prerequisite: CHE 203 and CHE 206, or CHE 223

CHE 332 - Organic Chemistry II
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Organic stereochemistry with emphasis on biologically important molecules.
Prerequisite: CHE 331

CHE 333 - Organic Chemistry III
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Free radical chemistry, pharmaceutical chemistry and the mechanistic aspects of enzymatic catalysis.
Prerequisite: CHE 332

CHE 335 - Bioorganic Chemistry
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
An overview of common organic chemistry mechanisms that occur in mammalian metabolism with a focus on molecular structure and reactivity of biological molecules and metabolites.
Prerequisite: CHE 331

CHE 341 - Instr Methods/Data Acqustn I
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
As introduction to the theory and practical applications of computer/instrument interfacing and data acquisition techniques and software. Includes a survey of optical measurement techniques.
Prerequisite: CHE 235
Corequisite: CST 116 or MIS 115 or instructor consent

CHE 342 - Instr Methods/Data Acqustn II
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Principles and techniques of instrumental methods and data analysis. Methods appropriate for chemical analysis including spectroscopy, gas chromatography, potentiometric and flame photometric methods. Emphasis on sample preparation, instrumental response, sensitivity, and accuracy.
Prerequisite: CHE 341

CHE 345 - Corrosion Chemistry
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
A survey of the chemical kinetics and thermodynamics of corrosion, the various types of corrosion, inhibition of corrosion, and industrial applications.
Prerequisites: CHE 101 and CHE 104, CHE 201 and CHE 204, or CHE 221, and PHY 202 or instructor consent

CHE 346 - Corrosion Chemistry Lab
Lecture Hours: 0
Lab Hours: 3
Credit Hours: 1
Laboratory accompanying CHE 345. Providing practical experience with electrochemical equipment used to measure corrosion processes.
Corequisite: CHE 345

CHE 350 - Clinical Pharmacology/NMT
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Principles of pharmacokinetics, pharmacodynamics and survey of the major drug families developing familiarity with commonly prescribed drugs, their clinical application, mechanism of action and side effects. Emphasis is on drugs of importance to nuclear medicine and the common radiopharmaceuticals.
Prerequisite: BIO 233 or BIO 333 or instructor consent

CHE 360 - Clinical Pharmacology/Hlth Prf
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Principles of pharmacokinetics, pharmacodynamics and a survey of the major drug families developing familiarity with the most commonly prescribed drugs, their clinical application, mechanism of action and side effects.
Prerequisite: BIO 233 or BIO 333 or instructor consent

CHE 407 - Seminar
Lecture Hours: 8
Lab Hours: 8
Credit Hours: 8
(Hours to be arranged each term.)

CHE 450 - Biochemistry I
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Molecular and cellular biochemistry with emphasis on DNA structure, replication, the process and cellular regulation of RNA transcription, and analyzing and constructing DNA.
Prerequisites: BIO 213 and CHE 332

CHE 451 - Biochemistry II
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Molecular biochemistry with emphasis on protein conformation and function, mechanisms of enzyme action and control, and energy production via glycolysis.
Prerequisite: CHE 450

CHE 452 - Biochemistry III
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Molecular and cellular biochemistry with emphasis on cell membranes, lipid metabolism, aerobic energy metabolism, anabolism, and the role of biochemistry in cellular signaling processes.
Prerequisite: CHE 451

CHE 465 - Fate/Transport of Pollutants
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Application of principles learned in CHE 315. Mass Balance and the use of chemical equilibrium and kinetics to calculate pollutant transport in environmental compartments. Discussion and use of partitioning coefficients to determine fate of pollutants in water, soil and air.
Prerequisite: CHE 315

CHE 495 - Research Project in Chemistry
Lecture Hours: 0
Lab Hours: 0
Credit Hours: Varies (1-4)
Supports student-initiated research project in biological sciences. Topic and scope must be reviewed and accepted by a faculty advisor. May be repeated for up to nine total credits.
Prerequisite: Instructor consent

Communication

COM 104 - Introduction to Communication
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Introduces Communication Studies. Principles and applications developed in context of career exploration, interpersonal, group, organizational, and technical communication. Includes history and structure of communication field, career paths, research skills and role of technology. Required for COM majors.

COM 105 - Intro to Communication Theory
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Introduces basic theories and concepts in the Communication discipline. Acquaints students with major theories fundamental to communication research and to communication interactions including interpersonal, organizational, media and intercultural.
Prerequisite: COM 104
Pre- or Corequisite: WRI 122

COM 106 - Introduction to Comm Research
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Introduces research in the communication discipline. Students find and analyze quantitative, qualitative and critical research. Introduces communication research as a process composed of methods, data-gathering, analysis, conclusions.
Prerequisite: COM 105

COM 107 - Seminar
Lecture Hours: 0
Lab Hours: 0
Credit Hours: 15
(Hours to be arranged each term.)

COM 109 - Intro to Communication Tech
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
Introduction to the use of communication technology. Emphasis on the use of various communication technologies including social media, instant messaging, and visual communication technologies. Features projects using technology to effectively communicate to various audiences.

COM 115 - Intro to Mass Communication
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Provides an introduction to mass media. Focuses on understanding how media operate with emphasis on contemporary social, economic, political, cultural and ethical issues.

COM 135 - Communication Software
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
Techniques for coordinated use of office software, including word processing (style definitions, template creations, graphic use), data analysis (function use, custom functions, data importation), and presentation (master style definitions, visual effects, dynamic content creation) software, and cross-application functions.

COM 205 - Intercultural Comm
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Introduces basic theories and concepts of intercultural communication. Builds understanding and skills enabling students to analyze intercultural interactions and develop and practice effective communication strategies.

COM 207 - Seminar
Lecture Hours: 6
Lab Hours: 0
Credit Hours: 6
(Hours to be arranged each term.)

COM 215 - Creativity in Comm
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Define and learn how personal and group creativity can be enhanced. Study the lives of creative individuals in the arts, sciences, and industry. Individual and group exercises designed to enhance the creative process.

COM 216 - Essen of Grammar & Punctuation
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Involves learning basic and advanced grammar and punctuation to provide a firm foundation for any type of writing.
Prerequisite: WRI 121 with grade "C" or better

COM 225 - Interpers Communication
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Introduces interpersonal communication theory and practice. Students apply course concepts to analyze and practice dyadic communication to develop more effective work and personal relationships.

COM 226 - Nonverbal Communication
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Nonlinguistic aspects of human communication. Examines the relationships between nonverbal and verbal communication behavior and nonverbal communication skill. Topics include space, distance, environment, touch, gesture, facial expression and gaze as communication.

COM 237 - Intro to Visual Communication
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Introduces theory and rhetoric through several perspectives: personal, historical, technical, ethical, cultural, and critical. Emphasizes relationships between form/content, word/image, and societal role of visual communication.
Prerequisite: WRI 122

COM 248 - Digital Media Production
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
Study of the technical aspects of digital media design and production. Hands-on experience in creating and editing digital media. Production of digital media for specific contexts.

COM 255 - Communication Ethics
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Examines typical communication situations involving ethics. Provides methodologies for critically evaluating ethical situations. Uses case approach with emphasis on application.
Prerequisite: WRI 122

COM 256 - Public Relations
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Introduces history and practice of public relations; emphasizes practical accomplishment of public relations campaigns. Topics: internal/external audiences, brochures, press releases, internal documents, pitches, issue management, and project design, execution. Service learning course.
Prerequisite: WRI 122

COM 276 - Democracy and Media
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Provides introduction to ownership/structure of media, politics, objectives, and links to the corporate and national economy. Introduces project analysis through ownership, sourcing, flak, advertising, ideology filters.
Prerequisites: COM 115 and WRI 122

COM 301 - Rhetorical Theory & Applicatn
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Introduces rhetorical theories and applications to personal, business and industrial settings. Focuses on evolution of rhetoric. Examines rhetorical effects on individual, group and mass communication.
Prerequisites: SPE 111 and WRI 227

COM 305 - Contemporary Rhetorical Theory
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Explores contemporary rhetorical theory in its development over the 20th century. Topics range from the need for a new rhetoric to critical rhetorical theories of power, race, and gender.
Prerequisites: SPE 111 and WRI 121

COM 307 - Seminar
Lecture Hours: 0
Lab Hours: 0
Credit Hours: 15
(Hours to be arranged each term.)

COM 309 - Communication Tech in Use
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
Advanced use of communication technology. Emphasis on the use of communication technology to achieve specific communication goals. Features a large project using multiple communication technologies to reach specific audiences.
Prerequisites: COM 109, MIS 101, MIS 102, and MIS 103

COM 320 - Advanced Intercultural Comm
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Builds on theories from COM 205. Focuses on analyzing intercultural interactions in specific work contexts, for example health care, education, social services, business and technology.
Prerequisite: COM 205

COM 325 - Gender and Communication
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Introduces basic theories and concepts of culturally-derived gendered communication patterns and behaviors. Builds understanding and skills enabling students to analyze those patterns and behaviors in order to develop and practice effective communication strategies.
Prerequisite: COM 205

COM 326 - Communication Research
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Introduction to research methods and design. Design of both quantitative and qualitative research. Emphasis on communication based methodologies: focus groups, directed interviews, and ethnomethodologies. Includes a research project and written and oral research reports.
Pre- or Corequisite: WRI 227

COM 336 - Nonverbal Communication
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Nonlinguistic aspects of human communication. Examines the relationships between nonverbal and verbal communication behavior and nonverbal communication skill. Topics include space, distance, environment, touch, gesture, facial expression and gaze as communication.
Prerequisites: COM 225 and SPE 111

COM 345 - Organization Comm I
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Studies communication in organizations, including message movement, exchange and interpretation, identification of variables, roles and patterns influencing communication in organizations.

COM 346 - Health Communication
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Overview of interpersonal, social, and cultural issues in health communication, including family interaction, roles of patients and caregivers, communication in health organizations and the role of media.
Prerequisites: WRI 122 with grade "C" or better, and COM 205 or equivalent

COM 347 - Negotiation & Conflict Resol'n
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Examines theories and strategies for conduct of conflict and negotiation across contexts. Topics: destructive conflict cycles, confronting/managing conflict, social/psychological aspects, conflict analysis, causes, and promoting constructive conflict.
Prerequisite: SPE 321 or instructor consent

COM 348 - Facilitation
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Provides experience leading small groups through deliberative processes including participatory decision making and conflict resolution. Provides theoretical and practical understanding of facilitation focusing on building skills in group leadership.
Prerequisite: SPE 321

COM 358 - Communication and the Law
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Issues involved in establishing legal parameters within which professional communicators work. Evolving interpretations of the first amendment, balancing conflicting first amendment claims, libel, limits of a free press, prior restraint, licensing and regulation.
Prerequisites: SPE 111 and WRI 227

COM 365 - Electronic Comm & Society
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Explores the Internet as a mediator of human communication and its effect on society. Topics include: social media, informatics, entertainment/workplace contexts, and the convergence of technology as a global village.
Prerequisite: WRI 227

COM 401 - Civil Engineering Project I
Lecture Hours: 2
Lab Hours: 0
Credit Hours: 3
First term of two-term sequence integrating civil engineering design, group dynamics and technical communications. Students receive three credit hours in civil engineering design (CE 401) and three credit hours in communication for general education (COM 401). Students will be introduced to a major civil engineering project, prepare a professional engineering proposal and function effectively in engineering design teams. Formal written proposal and oral presentation of the proposal are required.
Prerequisite: Civil Engineering advisor consent
Corequisite: CE 401

COM 402 - Civil Engineering Project II
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Second term of a two-term sequence. Students receive three credit hours in civil engineering design (CE 402) and three credit hours in communication for general education (COM 402). Student teams will perform work as defined in the fall term proposal. Consultations with faculty, students, and clients ensure work progresses toward stated goals. Term culminates with final design recommendations presented in a written report and oral presentation. Plans, specifications, and a construction cost estimate will also be completed.

COM 407 - Seminar
Lecture Hours: 15
Lab Hours: 0
Credit Hours: 15
(Hours to be arranged each term.)

COM 415 - Dev Eff Multmdia Presntn
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Interdisciplinary course introducing students to the tools and skills associated with designing, developing, presenting, and dissemination state-of-the-art multimedia presentations. Hands-on experience with graphics, digital/audio video, animation, and text.

Pre or Corequisites: CST 102 or equivalent, or instructor consent; PWR 220

COM 420 - Externship
Lecture Hours: 0
Lab Hours: 0
Credit Hours: 15
Students work in applied settings in their emphasis under the supervision of an on-site mentor. Regular contact with extern advisor. Written externship reports required.
Prerequisite: Senior standing

COM 421 - Senior Project I
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Allows students to initiate research on a significant capstone project in the communication field. Focuses on development of a proposal and presentation.
Prerequisite: Senior standing

COM 422 - Senior Project II
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Continues work of COM 421, focusing on project research methodologies.
Prerequisite: COM 421

COM 423 - Senior Project III
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Focuses on completion of project, including final documentation and presentation.
Prerequisite: COM 422

COM 424 - Capstone Course
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Communication Studies majors complete a significant research project that bridges education with future profession or graduate school. Students collaboratively produce a project or portfolio reflecting strong critical thinking and application of communication theory and practice. Project topics vary by instructor.
Prerequisites: WRI 227 and Senior standing

COM 425 - Mediation
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Prepares students to mediate in public and private settings. Covers conflict management strategies, processes and issues including gender and cultural awareness.
Prerequisite: COM 225 or instructor consent

COM 426 - Mediation Practicum
Lecture Hours: 0
Lab Hours: 3
Credit Hours: 3
Mediation practice and observation with experienced mediators through the Klamath Mediation Center. Students will progress from observation, to co-mediation, and finally, mediation of real disputes. Builds on the theoretical insights and practice of COM 425.
Pre- or Corequisite: COM 425

COM 437 - Comm Training & Devpmt
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Prepares students to facilitate communication skills workshops and differentiate between organizational structure and communication training needs. Topics include: audience analysis, learning theory, curriculum design, presentation skills, classroom dynamics and assessment.
Prerequisite: SPE 321

COM 445 - Organiz'l Communication II
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Examines organizational communication systems and the design of communication audit procedures. Synoptic reports of findings and recommendations.
Prerequisite: COM 345 or instructor consent

COM 446 - Communication & Leadership
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Explores the relationship between communication and leadership within organizations and the development and application of communication competencies associated with effective leadership.
Prerequisite: SPE 321 or instructor consent

Clinical Sleep Health

CSH 201 - Human Development and Sleep Health
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Normal sleep architecture over the lifespan. Behavioral, physiological, and environmental patterns that contribute to healthy sleep.

CSH 220 - Sleep Disord & Co-Morbid
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Pathophysiology, epidemiology, and clinical presentation of abnormal sleep. Understanding and recognition of major comorbidities associated with sleep disorders.

CSH 225 - Imp of Neuro Disord on Slp
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Effect and management of chronic neurological disorders on sleep quality and therapy outcomes.

CSH 233 - Sleep Therapies & Compliance
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Nonprescription sleep therapies, PAP, CBT, Light Therapy, Chronotherapy and other treatment modalities. Patient compliance issues, predictors of outcomes, and psychological theories.

CSH 236 - Pharmacology of Sleep
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Different classes of medication, dependency, addiction, long term effect on sleep, and prognosis for other sleep therapies.

CSH 242 - Evaluation & Measurement Tools
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Physiological, psychological, and psychomotor evaluation and measurement tools to assess severity of sleep disorders and patient response to therapy.

CSH 255 - Oral Appliances for Sleep Apnea
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Review all types of oral appliances and their appropriate applications and preparations for use with sleep apnea patients.

CSH 268 - Lrng, Hlth Lit, & Comm Edu
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Adult education theories, appropriate communication strategies for health literacy, development of programming for patients, families, allied health providers, and community groups.

CSH 276 - Capstone Project
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Students develop, plan and implement a project for community sleep education. Instructor functions as a consultant.
Prerequisite: CSH 268

CSH 277 - Clinical Sleep Health Extern
Lecture Hours: 0
Lab Hours: 40
Credit Hours: 13
Clinical skills essential for the practice of sleep case management. Patient assessment, creation of individualized care plan, long term compliance monitoring, and identification of changes in the status of other chronic diseases. Students must be employed in a clinical facility that treats sleep disordered patients. (400 contact hours).
Prerequisite: CSH 268

Computer Systems Engineering Technology

CST 102 - Intro Computer Systems
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 3
Concepts, terms, and trends related to the Computer Engineering Technology (hardware) and Software Engineering Technology (software) curriculums. Includes discussions on fundamental aspects of the computer field. Laboratory component will introduce students to microcomputers, programming concepts and various computer/engineering related software.
Prerequisite: CSET major or instructor consent

CST 107 - Seminar
Lecture Hours: 0
Lab Hours: 0
Credit Hours: 15
(Hours to be arranged each term.)

CST 116 - C++ Programming I
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Computer concepts and problem solving methods using C++ programming language. Topics include: algorithms, simple data types, conditional and iterative structures, function definition, structured programming and documentation. Cannot be taken for graduation credit if student has completed MIS 116.
Pre- or Corequisite: MATH 111

CST 120 - Embedded C
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
C programming concepts for embedded platforms such as cross-compilation, storage classes, dynamic memory allocation, bitwise operations and masking. Embedded systems topics such as I/O ports, interrupts, timers and hardware interfacing will also be explored.
Prerequisites: CST 126 and CST 162

CST 126 - C++ Programming II
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Solving complex problems using advanced features of the C++ language. Topics include function usage, pointer data type, dynamic memory allocation, string manipulation, and structure and union data types. Emphasis is on structured program design techniques. Cannot be taken for graduation credit if student has completed MIS 126.
Prerequisite: CST 116 with grade "C" or better

CST 130 - Computer Organization
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Introduces computer elements, organization, and instruction sets. Computer arithmetic, ALU, Registers, Datapath, memory and Control unit functions. Course includes laboratory.
Prerequisite: CST 162 with grade "C" or better

CST 131 - Computer Architecture
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Continuation of CST 130. Topics include: main memory, cache, virtual memory, memory management, secondary storage, networks, operating system functions, and pipelining.
Prerequisite: CST 130 with grade "C" or better

CST 133 - Digital Logic II
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Introduction to sequential logic, latches, flif-flops, registers, counters, timers, finite state machines. Implementation in programmable logic devices using HDL. DC and AC parameters, timing analysis. Laboratory is integral to class.
Prerequisite: CST 162 or EE 131, both with grade "C" or better

CST 134 - Instrumentation
Lecture Hours: 0
Lab Hours: 3
Credit Hours: 1
Lecture/laboratory course that provides students experience in measuring, calibrating, and testing digital and analog systems. Uses various test equipment for test and measurement of digital and analog components.
Pre- or Corequisite: CST 133

CST 136 - OOP with C++
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
A study of object oriented programming with C++. Beginning and intermediate concepts are covered including classes, objects, member functions, overloading, inheritance, polymorphism, templates, and virtual functions. This course prepares students with a strong C background for upper division coursework using C++. Cannot be taken for graduation credit if student has completed MIS 136.
Prerequisite: CST 126 with grade "C" or better

CST 162 - Digital Logic I
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Introduction to combinational logic. Includes introduction to number systems, Boolean algebra, logic gates, Muxes, Decoders, Adders, Subtracters. Logic design using a hardware description language. Laboratory integral to the class.
Pre- or Corequisite: MATH 100

CST 204 - Intro to Microcontrollers
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
An introduction to microcontrollers (uC). Signals and data flow within simple systems. Introduction to instruction set, software development tools and I/O techniques, both programmed and interrupt-driven. Experiments using uC plus external circuits in applications.
Prerequisites: CST 131 and CST 250, both with grade "C" or better, or instructor consent

CST 207 - Seminar
Lecture Hours: 6
Lab Hours: 0
Credit Hours: 6
(Hours to be arranged each term.)

CST 211 - Data Structures
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Discussion of efficient methods of data representation such as stacks, queues, linked-lists, binary trees, B-trees. Emphasis is on data representation and algorithm analysis.
Prerequisite: CST 136 with grade "C" or better

CST 223 - Concepts of Programming Lang
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
Study of principles and fundamental concepts characterizing high-level programming languages, including history and survey of programming paradigms, syntax and semantic rules, data types, control flow and data abstraction.
Prerequisite: CST 126 with grade "C" or better

CST 229 - Introduction to Grammars
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
The concepts involving alphabet words and languages will be discussed. Related topics in automata and regular expression will be explored. Emphasis is on context free grammars, parse tree and parsing techniques.
Prerequisites: CST 136, and CST 223 or CST 231

CST 231 - Digital Systems Design I
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Concepts, terminology and techniques in design and implementation of digital system

components. Synchronous sequential logic design with emphasis on state machines. System design process including synthesis using Verilog HDL and implementation in programmable logic devices. Lab integral to course.
Prerequisite: CST 133 with grade "C" or better

CST 236 - Engineering for Quality Software
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
This course teaches industry standard tools to enforce best practices to ensure quality software. Topics include project management, the Agile methodology, build management, and testing methodologies.
Prerequisite: CST 136 with grade "C" or better

CST 238 - GUI Programming
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Introduction to HCI and GUI design in a rapid application development environment. Prerequisite material in delegation, events, and multithreaded programming included. Topics include: forms, containers, components, controls, modal/modeless windows, fixed/dynamic layouts, SDI/MDI applications, application internationalization, and data binding.
Pre- or Corequisite: CST 211

CST 240 - Linux Programming
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Students will study the structure of the Linux Operating System, including: file structure, input/output processing, commands and utilities, shell configuration, communications and script programming languages. Students will write programs using processes, threads, and sockets.
Prerequisite: CST 126 with grade "C" or better

CST 250 - Computer Assembly Lang
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Concepts of assembly language programming applied to a modern computer; data and instruction formats, address generation; data definition, storage allocation and program control statements; sub-routine library; CPU instruction set; control records; and writing of sub-routines.
Prerequisites: CST 126 and CST 130 with grade "C" or better

CST 262 - Digital Design Using HDL
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Advanced digital circuit design. HDL is used in designing sequential logic circuits such as registers, counters, and synchronous finite state machines. Basic digital circuit design and analysis with semiconductor devices is also covered. Laboratory is integral to the class.
Prerequisites: CST 162 with grade "C" or better, or EET 101 and EET 102

CST 276 - Software Design Pattern
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Design patterns establish a common terminology allowing developers to use a common vocabulary and share a common viewpoint of the problem. Design patterns provide a common point of reference during the analysis and design phase of a project.
Prerequisite: CST 136 with grade "C" or better

CST 307 - Seminar
Lecture Hours: 0
Lab Hours: 0
Credit Hours: 15
(Hours to be arranged each term.)

CST 315 - Embedded Sensor Inter & I/O
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Introduction to data acquisition systems, sampling theory, ADC, DAC, signal conditioning, filters, amplifiers, noise, transducers and sensors, including bio-sensors, sensor interfacing, smart sensors, and busses. Lab integral to course.
Prerequisites: CST 204 and EE 221

CST 316 - JR Team-Based Proj Dev I
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
In this three-term sequence, students will work in teams to gather requirements, model, analyze, develop and integrate an n-tiered architecture software product. Students will learn about project management, software development lifecycle tools and processes, and quality assurance processes.
Prerequisite: CST 211 with grade "C" or better
Pre- or Corequisites: CST 324 with grade "C" or better, and at least two of CST 236, CST 238, CST 276, all with grade "C" or better

CST 320 - Compiler Methods
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Basic concepts of compiler design and operation. Topics include lexical and syntactical analysis, parsing, translation, data flow analysis and code generation, and implementation of a small compiler.
Prerequisite: CST 211 with grade "C" or better, and CST 229

CST 321 - Intro to Microprocessors
Lecture Hours: 3
Lab Hours: 6
Credit Hours: 5
Hardware and assembly level software needed to interface a microprocessor to I/O ports, memory and interrupt sources. Topics include bus controller design, timing analysis, programmed I/O and interrupts. Extensive lab provides experience with system design, test and debugging using the 80386DX microprocessor.
Prerequisites: CST 204 and CST 231, with grade "C" or better, or instructor consent

CST 324 - Database Systems and Design
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
An overview of Data Base Management Systems including requirements analysis methodology for data base design, conceptual DB design methodology including formulation of entity-relationship models, review of query language characteristics, and a comparison of commonly available DBMS.
Prerequisite: CST 211 with grade "C" or better

CST 326 - JR Team-Based Proj Dev II
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
In this three term sequence, students will work in teams to gather requirements, model, analyze, develop and integrate an n-tiered architecture software product. Students will learn about project management, software development lifecycle tools and processes, and quality assurance processes.
Prerequisite: CST 316

CST 328 - Graph, Gmes, & Sim Progrmmng
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
Introduction to games and simulations programming using a high end game development engine. Graphics topics include: geometric transformations, physics simulation, collision detection/handling, and ray tracing/casting. Artificial intelligence topics: game theory, probability, steering behaviors, flocking behaviors, path-finding, and behavior trees.
Prerequisite: CST 238 or instructor consent

CST 331 - Microproc Periph Interfacing
Lecture Hours: 3
Lab Hours: 6
Credit Hours: 5
Expansion of processor based systems through off chip parallel bus interfacing. Adding off chip I/O ports, memory and parallel I/O devices. I/O port expansion through serial interface. In depth interface timing analysis. Extensive lab provides continued experience with system design, test and debugging techniques.
Prerequisites: CST 231 with grade "C" or better, and CST 321 or CST 337

CST 334 - Project Proposal
Lecture Hours: 1
Lab Hours: 0
Credit Hours: 1
Description of senior project; time management techniques; task assignment; development of in-depth senior project proposal and preparation of formal senior project. Includes use of PC-based planning.
Pre- or Corequisite: CST 336 or CST 373

CST 335 - I/O Device Interfacing Tech
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Application of opto-couplers, peripheral drivers, A-D converters, and operational amplifiers to microprocessor/microcontroller based applications. Survey of transducer theory and available devices. An embedded system is used as a development platform in laboratory experiments.
Prerequisites: CST 204 and EE 223, or EET 237 and EET 238, or instructor consent

CST 336 - JR Team-Based Proj Dev III
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
In this three-term sequence, students will work in teams to gather requirements, model, analyze, develop and integrate an n-tiered architecture software product. Students will learn about project management, software development lifecycle tools and processes, and quality assurance processes.
Prerequisite: CST 326

CST 337 - Embedded System Architecture
Lecture Hours: 3
Lab Hours: 6
Credit Hours: 5
Configuration, programming, testing, debugging of embedded systems. Serial interfaces including RS232, I2C and SPI. I/O methods including programmed I/O, interrupts and DMS. Interfacing issues related to timing and protocol. Impact of processor architect and I/O methods on system performance.
Prerequisite: CST 204 with grade "C" or better

CST 340 - Advanced UNIX
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
Advanced facets of the UNIX operating system will be explored. Topics include: interprocesses communication, programming, system administration. Students will use OIT computers operating under UNIX.
Prerequisite: CST 240

CST 344 - Interm Computer Arch
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Register level design of a computer system, including the processor and memory structures. Cache and virtual memory. Includes analysis of both CISC (Complex Instruction Set Computer) and RISC (Reduced Instruction Set Computer) architectures.
Prerequisite: CST 204

CST 346 - .NET Programming in C#
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
Essentials of programming using the C# language. It emphasizes C# programming structure, syntax, design, and implementation essentials, as well as a brief overview of the .NET framework. Creating Windows Forms and accessing ADO.NET are also examined.
Prerequisite: CST 211

CST 347 - Real Time Embedded Op Systems
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
OS Kernel Constructs and problem scaling, small scale environment specification, process, threads, fibers, synchronization primitives, small scale memory management, scheduling paradigms, real time scheduling, I/O and debugging. Lab integral to course.
Prerequisites: CST 211 and CST 240, both with grade "C" or better

CST 350 - Intro to VLSI Design
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
An introduction to the various aspects of very large scale integration circuits. Includes modern design techniques, using CAD/CAE software tools. Design using standard cell techniques, discussion of full custom design and VLSI testing concepts. Demonstrations are included to supplement lectures. The course will include laboratory experience.
Prerequisites: CST 231, CST 232, and EE 321, or instructor consent

CST 351 - Digital Systems Design II
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
Continuation of Digital Systems Design I. Focus on timing, test benches, testing, and security in programmable logic devices. Laboratory includes analysis, design, synthesis, simulation and testing of complete digital systems.
Prerequisite: CST 231

CST 352 - Operating Systems
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Issues in Operating Systems design. Topics include: processes, threads and fibers, privilege modes, preemptive multitasking, process state machine, scheduling paradigms, system calls/traps, shared resources and synchronization primitives, memory management schemes/virtual memory, deadlock detection, handling, and avoidance, I/O management.
Prerequisites: CST 211 and CST 240, both with grade "C" or better

CST 356 - Web Design and Development
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
Basic components of web development which include aspects of design as well as current development technologies. Development technologies include, but are not limited to, HTML/XHTML, JavaScript, and CSS. Other technologies discussed may include Java Applets, CGI programming, ASP.NET and PHP.
Prerequisite: CST 211

CST 371 - Embedded Systems Development I
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
A three term sequence covering design, implementation, test and documentation techniques used for embedded computer systems. Each student is required to work on and complete a project as a member of a team. The entire sequence must be completed in three consecutive terms.
Prerequisite: CST 204
Corequisite: CST 315 or CST 335

CST 372 - Embedded Systems Develop II
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
Second course in a three term sequence. Design, implementation, test and documentation techniques used for embedded computer systems. Each student is required to work on and complete a project as a member of a team. The entire sequence must be completed in three consecutive terms.
Prerequisite: CST 371

CST 373 - Embedded Systems Develop III
Lecture Hours: 1
Lab Hours: 3
Credit Hours: 2
Final course in a three term sequence. Design, implementation, test and documentation techniques used for embedded computer systems. Each student is required to work on and complete a project as a member of a team. The entire sequence must be completed in three consecutive terms.
Prerequisite: CST 372

CST 374 - Embedded Project Proposal
Lecture Hours: 1
Lab Hours: 0
Credit Hours: 1
Development of formal, in-depth embedded

senior project proposal. Guidelines for an acceptable project; project and time management techniques; task assignment. Individual creativity will be encouraged by allowing the student to select an appropriate embedded systems project.
Pre- or Corequisite: CST 373

CST 405 - Directed Study
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Advanced study under the guidance of faculty. Topics and learning objectives arranged between students and instructor. Students will meet with instructor weekly to discuss progress and provide evidence of their performance.
Prerequisites: Junior standing in CSET and instructor consent

CST 407 - Seminar
Lecture Hours: 18
Lab Hours: 18
Credit Hours: 18
(Hours to be arranged each term.)

CST 412 - Senior Development Proj
Lecture Hours: 2
Lab Hours: 5
Credit Hours: 3
A three-term sequence giving the student major responsibility for planning and carrying out a computer-oriented project. Individual creativity will be encouraged by allowing the student to select an appropriate project.
Prerequisites: CST 334, and CST 336 or CST 373

CST 415 - Computer Networks
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Current issues in computer networks and distributed systems. Topics include network protocols, interface standards, and transmissions mode. Network layers detailing Internet Protocol Suite and correlations with 7 layer abstract communication model. Routing and WAN architectures.
Prerequisite: CST 240 with grade "C" or better

CST 417 - Embedded Networking
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Network protocol in a small scale embedded environment, Physical characteristic specification, network interface, controller interface, TCP/IP, application interface, packet routing, network architecture. Lab integral to course.
Pre- or Corequisite: CST 336 or CST 373 with grade "C" or better

CST 418 - Data Comm & Networks
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Provides students with an introduction to data communications and computer networks. Students acquire knowledge of communications components and their use in implementing a network. Emphasis is on the practical aspects of network configuration, operations, and detection, isolation and correction of problems.
Prerequisites: CST 204, and EE 223 or EET 237

CST 420 - Effective C++ & STL
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
Emphasis is on techniques to apply the C++ language and library effectively toward the implementation of object oriented systems. Specific ways to improve design and program will be covered as well as purpose and use of the C++ Standard Library.
Prerequisite: CST 320 or instructor consent

CST 422 - Sr Development Project
Lecture Hours: 2
Lab Hours: 5
Credit Hours: 3
A three-term sequence giving the student major responsibility for planning and carrying out a computer-oriented project. Individual creativity will be encouraged by allowing the student to select an appropriate project.
Prerequisites: CST 334, and CST 336 or CST 373

CST 426 - Intro to Artif Intell
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Concepts and techniques of AI with considerable use of the LISP interpreter. Includes discussion of 'search' methods, knowledge representation, natural language processing, models of cognition, vision, and 'The Blocks World.'

CST 432 - Senior Development Proj
Lecture Hours: 1
Lab Hours: 3
Credit Hours: 2
A three-term sequence giving the student major responsibility for planning and carrying out a computer-oriented project. Individual creativity will be encouraged by allowing the student to select an appropriate project.
Prerequisites: CST 334, and CST 336 or CST 373

CST 435 - Microprogramming
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
The concepts and methods involved in programming the computer's control unit. Coverage includes a review of computer organization, microprogram operations such as floating point arithmetic, translator/simulator development, and emulation techniques.
Prerequisite: Software Engineering Technology Senior standing or instructor consent

CST 441 - Logic Synthesis with VHDL
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
This course will show students how to use the hardware description language, VHDL, with hierarchical design techniques to manage a complex design. In this process students will create a design using the VHDL modeling tools, simulate the design using advanced simulation techniques, synthesize and test the design. Laboratory integral with the course.
Prerequisite: CST 351 or instructor consent

CST 442 - Adv Comp Architecture
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Advanced concepts in computer architectures including pipelined, super pipelined, superscalar, and dynamically pipelined processor architectures. Parallel processors, multiprocessors, cache and cache coherency.
Prerequisite: CST 344 or instructor consent

CST 445 - Adv Microproc & Applic
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
This class examines the architecture of the Motorola 680X0 microprocessor family. The course investigates advanced design techniques used in developing interfaces to the 680X0 microprocessor family, along with the use of coprocessors and special device controllers. Advanced design concepts in both software and hardware will be examined.
Prerequisite: CST 331 or instructor consent

CST 451 - ASIC Design using FPGAs
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
FPGA senior project design specifications; presentation of the project in a design review to peers; application of formal hardware/software design techniques when designing with FPGAs; and verification of FPGAs.
Prerequisite: CST 441 or instructor consent

CST 455 - System on a Chip Design
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
System level design representations, and modeling languages. Target architecture models. Intra-chip communication. Partitioning algorithms. Task time measurement. Back annotation of timing. Synthesis of SoC components.
Prerequisites: CST 231 and CST 373

CST 456 - Embedded System Testing
Lecture Hours: 3
Lab Hours: 3

Credit Hours: 4
Testing of complete embedded systems including hardware and software. Topics include unit testing for both hardware and software, UVM testing framework for hardware and test driven design practices as they apply to both hardware and software.
Prerequisites: CST 136, CST 204, and CST 231

CST 461 - Adv Topics VLSI Design
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
Conclusion of a three-course sequence in very large scale integration design. This course focuses on testing methodology, especially boundary scan. In addition, an alternative synthesis tool is introduced. Current issues in VLSI design are discussed. Laboratory experiments form an essential part of the course.
Prerequisite: CST 441

CST 464 - RISC-Based Micro Sys
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
RISC architecture and applications. Includes i960 microprocessor features, instruction set, and i960 support software. Laboratory focus on applications.
Prerequisites: CST 331 and CST 344

CST 465 - Web Development with ASP.NET
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
Dynamic web site creation and development strategies using ASP.NET are discussed and practiced. Focus on the importance of databases in the creation of a dynamic web site is heavily emphasized.
Pre- or Corequisite: CST 324 or instructor consent

CST 466 - Embedded System Security
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Fundamental theories and applications of cryptography relevant to computer and embedded system security.
Prerequisites: CST 126 and MATH 112

CST 471 - Embedded Senior Project
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
A three-term sequence giving the student major responsibility for planning, implementing and testing an embedded systems project.
Prerequisites: CST 373 and CST 374

CST 472 - Embedded Senior Project
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
A three-term sequence giving the student major responsibility for planning, implementing and testing an embedded systems project.
Prerequisites: CST 373 and CST 374

CST 473 - Embedded Senior Project
Lecture Hours: 1
Lab Hours: 3
Credit Hours: 2
A three-term sequence giving the student major responsibility for planning, implementing and testing an embedded systems project.
Prerequisites: CST 373 and CST 374

CST 475 - Big-Data Analysis
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
Data analysis using very large data sets. Topics include loading, extracting, and analyzing data. Technologies include distributed SQL and No-SQL databases, map-reduce, and other distributed data access and processing mechanisms.
Prerequisite: CST 324

CST 490 - Co-op Field Practice
Lecture Hours: 0
Lab Hours: 0
Credit Hours: Varies
An approved work program related to the student's field of specialization for a continuous three-month or six-month period. The employer and the type, level, and difficulty of the particular job must be approved by the student's engineering technology department prior to the employment period. A written comprehensive report of each season's activity must be submitted during the following term of residence. This class cannot be repeated for credit.
Prerequisite: Instructor consent

Cybersecurity

CYB 201 - Cybersecurity Fundamentals
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Introduces fundamental concepts used in Cybersecurity. Topics covered include: threats, attacks, and vulnerabilities; confidentiality, integrity, and availability; common cybersecurity technologies and tools; security architecture and design principles; identity and access management; risk management; and cryptography.

CYB 301 - Hacker Tools and Techniques
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Introduces how "hackers" operate and the techniques, tools and processes they use to gain unauthorized access to systems, and how to best protect and defend systems from these same types of attack. Students will learn how to conduct basic security testing or "ethical hacking" to identify potential weaknesses in an organization's network and computer systems. Students will also learn how to prepare a formal written report of their findings for management.
Prerequisites: CYB 201 and MIS 285 both with grade "C" or better, and WRI 227

CYB 302 - System Defenses and Incident Response
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Introduces the CIS 20 Critical Controls and the fundamental concepts of operating system hardening and other defensive strategies to secure networks and information systems. Students will also learn how to investigate suspicious activity on computer systems to determine if it has been compromised, and how to respond to security incidents and data breaches.
Prerequisites: CYB 301 and MIS 351 both with grade "C" or better

CYB 303 - Security Operations and Analysis
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Introduces the concept of a Security Operations Center (SOC) and the role of a Security Analyst. Students will learn about Security Information and Event Management (SIEM) systems, Intrusion Detection Systems (IDS), log management and analysis, packet capture analysis, vulnerability analysis and patch management. Students will complete a team project during the course where they must monitor and defend systems as a group.
Prerequisites: CYB 301 with grade "C" or better, and SPE 321

CYB 351 - Network Security
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Examines tools and techniques used for securing IP based networks, with a specific focus on Firewalls and VPNs. Topics include stateful inspection firewall basics, explicit proxy, deep-packet inspection, intrusion detection and prevention systems, network based anti-virus, email filtering, data loss prevention, application control, traffic shaping, packet capture and analysis, and SSL and IPSec VPNs.
Prerequisites: CYB 201 and MIS 351 both with grade "C" or better

CYB 411 - Managing Risk in Information Systems
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Focus on the risk assessment and analysis processes as they are applied to information systems. Details of how confidentiality, integrity and availability are maintained in an organization's complex information systems are explored. Topics include quantitative and qualitative risk analysis, risk mitigation/transference/acceptance,

disaster recovery and business continuity planning, security program management, and security awareness training.
Prerequisites: BUS 215 or BUS 304 or BUS 317 and MIS 206 or MIS 311 or MIS 255 all with grade "C" or better

Dental Hygiene

DH 100 - Introduction to Dental Hygiene
Lecture Hours: 1
Lab Hours: 3
Credit Hours: 2
Orientation to the theory and practice of all aspects of the dental hygiene profession. The history of dental hygiene, professional organization and career opportunities are discussed. Hands-on activities involving basic dental hygiene skills. Opportunities to experience normal oral anatomy.

DH 101 - Intro to Dental Hyg II
Lecture Hours: 0
Lab Hours: 3
Credit Hours: 1
Hands-on activities involving the procedures and skills learned in DH 100. Students will practice basic dental hygiene skills. Opportunities to experience normal oral anatomy.
Prerequisite: DH 100

DH 107 - Seminar
Lecture Hours: 0
Lab Hours: 0
Credit Hours: 15
(Hours to be arranged each term.)

DH 207 - Seminar
Lecture Hours: 0
Lab Hours: 0
Credit Hours: 15
(Hours to be arranged each term.)

DH 221 - Clinical Prac & Seminar I
Lecture Hours: 2
Lab Hours: 6
Credit Hours: 4
Sequential courses designed to provide clinical skills essential for the practice of dental hygiene. Skill development of patient assessment, basic instrumentation and individualized preventive care emphasized.
Prerequisite: Admission to the Dental Hygiene program

DH 222 - Clinical Prac & Seminar II
Lecture Hours: 2
Lab Hours: 6
Credit Hours: 4
Sequential courses designed to provide clinical skills essential for the practice of dental hygiene. Skill development of patient assessment, basic instrumentation, and individualized preventive care emphasized.
Prerequisite: DH 221

DH 223 - Clinical Prac & Seminar III
Lecture Hours: 1
Lab Hours: 6
Credit Hours: 3
Sequential courses designed to provide clinical skills essential for the practice of dental hygiene. Skill development of patient assessment, basic instrumentation, and individualized preventive care emphasized.
Prerequisites: DH 222, and DH 252

DH 225 - Head/Neck Anat, Histol, Embry
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
Lecture and lab course that provides an in-depth study of head and neck anatomy, histology, and embryology for the dental professional. Emphasis on human development, anatomy in relation to facial and oral structures, and histology of hard and soft dental tissues.

DH 240 - Prevention I
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Beginning discussions about healthcare for the provider as a part of holistic healthcare, and foundations for preventing oral disease. Focus on strategies for improving oral health.
Prerequisite: Admission to the Dental Hygiene program
Corequisite: DH 221

DH 241 - Prevention II
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Second of a five-term series emphasizing prevention and management of caries; oral health education for individual patients and groups; and wellness for the healthcare provider.
Prerequisite: DH 240

DH 242 - Prevention III
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Third of a five term series emphasizing dental management and oral health education for a variety of age demographics including pregnancy, infants, children, and special needs children.
Prerequisite: DH 241

DH 244 - General and Oral Pathology
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Introduction to general pathology and common oral pathologies. Basic pathology, inflammation, immune system, and neoplasia. Etiology and recognition of benign and malignant oral and skin lesions. Descriptive terminology and differential diagnosis introduced.

DH 252 - Oral Radiology I
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
The first of a two course series that includes didactic and pre-clinical instruction in the principles and techniques of dental radiography.
Prerequisites: DH 225 and DH 266

DH 253 - Oral Radiology II
Lecture Hours: 2
Lab Hours: 0
Credit Hours: 2
The second of a two course series that includes didactic instruction in the principles and techniques of dental radiography with emphasis on image interpretation.
Prerequisites: DH 244 and DH 252

DH 254 - Introduction to Periodontology
Lecture Hours: 2
Lab Hours: 0
Credit Hours: 2
Introduction to periodontology with emphasis on etiology and pathogenesis of periodontal disease, disease classification, and assessment procedures.
Prerequisite: DH 244

DH 266 - Dental Anatomy
Lecture Hours: 2
Lab Hours: 0
Credit Hours: 2
In-depth study of crown and root morphology of primary and permanent dentitions, with tooth restoration considerations. The temporomandibular joint and occlusion will also be studied.

DH 267 - Emergency Procedures
Lecture Hours: 2
Lab Hours: 1
Credit Hours: 3
Prevention, preparation, and management of emergency situations common in the dental environment. Individual and team practice in carrying out emergency procedures.
Prerequisite: DH 244

DH 275 - Dental Ethics
Lecture Hours: 2
Lab Hours: 0
Credit Hours: 2
Professional ethics and legal requirements of the dental profession.

DH 299 - Laboratory Practice
Lecture Hours: 0
Lab Hours: 15
Credit Hours: 15
(Hours to be arranged each term.)

DH 307 - Seminar
Lecture Hours: 6
Lab Hours: 0
Credit Hours: 6
(Hours to be arranged each term.)

DH 321 - Clinical Prac & Sem IV
Lecture Hours: 2
Lab Hours: 6
Credit Hours: 4
Sequential courses designed for the continued development of dental hygiene skills necessary for entry into professional clinical practice. Ultrasonic, advanced instrumentation, and expanded dental

hygiene functions are practiced, in addition to observations in dental practice settings.
Prerequisite: DH 223

DH 322 - Clinical Prac & Sem V
Lecture Hours: 1
Lab Hours: 6
Credit Hours: 3
Sequential courses designed for the continued development of dental hygiene skills necessary for entry into profession clinical practice. Ultrasonic, advanced instrumentation, and expanded dental hygiene functions are practiced, in addition to observations in dental practice settings.
Prerequisite: DH 321

DH 323 - Clinical Prac & Sem VI
Lecture Hours: 1
Lab Hours: 12
Credit Hours: 5
Sequential courses designed for the continued development of dental hygiene skills necessary for entry into professional clinical practice. Ultrasonic, advanced instrumentation, and expanded dental hygiene functions are practiced, in addition to observations in dental practice settings.
Prerequisite: DH 322

DH 340 - Emerging Oral Health Topics
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Course emphasizing dental management of common conditions found in a variety of populations, exploration of current topics in dentistry, and oral health related trends commonly encountered in professional practice.
Prerequisite: DH 242

DH 341 - Vulnerable Populations
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Course emphasizing oral health education and dental management of patients with medically compromised status. A variety of systemic conditions are discussed in depth in regards to the unique needs and prevention strategies for each individual.
Prerequisite: DH 340

DH 344 - Adv General & Oral Pathology
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Further study of general and oral pathology. Developmental, hereditary, and congenital disorders. Endocrine, cardiovascular, hematopoietic, respiratory, gastrointestinal, neurologic, and skeletal disorders. Tooth abnormalities, radiographic lesions, and oral tissue enlargements. Systemic and oral complications of HIV and AIDS. Lesion description emphasized.
Prerequisite: DH 244

DH 351 - Pain Management I
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
The first of a two course series. Lecture: study of pharmacology, solutions, dosages, vasoconstrictors, drug interactions, medical history evaluation and contradictions. Laboratory practice in techniques of local anesthesia include basic injection technique including block infiltration.
Prerequisites: CHE 360 and DH 267

DH 352 - Pain Management II
Lecture Hours: 1
Lab Hours: 3
Credit Hours: 2
A continuation course of the pain management series. Coordinated lecture and laboratory practices in the recognition of dental anxiety; behavioral management; complications with anesthesia; nitrous oxide sedation techniques are practiced; advanced techniques in the administration of local anesthetics.
Prerequisite: DH 351

DH 354 - Periodontology
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Evidence-based approach for treatment of periodontal disease including nonsurgical and surgical treatment. Root anatomy relating to effective instrument adaptation. Treatment planning for patients with all types of classifications of periodontal disease.
Prerequisite: DH 254

DH 363 - Dental Materials
Lecture Hours: 2
Lab Hours: 6
Credit Hours: 4
General properties, composition and manipulation of common dental and restorative materials. Expanded functions including denture relines and amalgam polishing are practiced.

DH 370 - International Extrnshp I
Lecture Hours: 1
Lab Hours: 0
Credit Hours: 1
Sequential courses preparing for and providing dental hygiene care at an international site using portable dental equipment. Cultural issues, teamwork, financing, needs assessment, goal setting, and delivery of program.
Prerequisites: DH 321 and DH 381

DH 371 - International Extrnshp II
Lecture Hours: 1
Lab Hours: 0
Credit Hours: 1
Sequential courses preparing for and providing dental hygiene care at an international site using portable dental equipment. Cultural issues, teamwork, financing, needs assessment, goal setting and delivery of program.
Prerequisite: DH 370

DH 372 - International Extrnshp III
Lecture Hours: 0
Lab Hours: 3
Credit Hours: 1
Sequential courses preparing for and providing dental hygiene care at an international site using portable dental equipment. Cultural issues, teamwork, financing, needs assessment, goal setting and delivery of program.
Prerequisite: DH 371

DH 380 - Comm Dentl Hlth I
Lecture Hours: 1
Lab Hours: 3
Credit Hours: 2
First in a four course sequence using a service learning approach. Students work in teams, identify target groups and conduct a needs assessment. Introduction to public health agencies and their functions; and to the role of the dental hygienist in public health.
Prerequisite: DH 241
Corequisite: DH 242

DH 381 - Comm Dentl Hlth II
Lecture Hours: 1
Lab Hours: 3
Credit Hours: 2
Service learning and systematic approach to developing oral health programs continues. Teams complete a program based on the needs assessment. Community health education and health literacy are emphasized. Grant writing for program funding is practiced.
Prerequisite: DH 380

DH 382 - Comm Dentl Hlth III
Lecture Hours: 1
Lab Hours: 3
Credit Hours: 2
Service learning and systematic approach for implementing community oral health programs continues. Teams implement programs they designed. Health education occurs in the community. A broad view of public health including advocacy, epidemiology, research; controversy of water fluoridation.
Prerequisite: DH 381

DH 383 - Comm Dentl Hlth IV
Lecture Hours: 0
Lab Hours: 3
Credit Hours: 1
Service learning and systematic approach for community oral health programs is continued. Teams complete implementation and evaluate of programs. Teams share results of programs and recommendations for future in public relations and written documentation in a portfolio and year-end report.
Prerequisite: DH 382

DH 399 - Lab Practice
Lecture Hours: 0
Lab Hours: 6
Credit Hours: 6
(Hours to be arranged each term.)

DH 401 - Overview Advanced Dental Hyg
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Introduction to the online degree completion program. Career opportunities, roles of the dental hygienist, and the different emphases within the program are explored.
Prerequisite: Admission to the BDHO program

DH 407 - Seminar
Lecture Hours: 0
Lab Hours: 0
Credit Hours: 4
(Hours to be arranged each term.)

DH 421 - Clinical Prac & Sem VII
Lecture Hours: 2
Lab Hours: 6
Credit Hours: 4
Further refinement of clinical instrumentation and assessment skills. Emphasis on individualized care for patients with diverse oral needs. Variety of off-campus practice settings experienced.
Prerequisite: DH 323 and DH 352

DH 422 - Clinical Prac & Sem VIII
Lecture Hours: 1
Lab Hours: 12
Credit Hours: 5
Further refinement of clinical instrumentation and assessment skills. Emphasis on individualized care for patients with diverse oral needs. Variety of off-campus practice settings experienced.
Prerequisite: DH 421

DH 423 - Clinical Prac & Sem IX
Lecture Hours: 1
Lab Hours: 12
Credit Hours: 5
Further refinement of clinical instrumentation and assessment skills. Emphasis on individualized care for patients with diverse oral needs. Variety of off-campus practice settings experienced.
Prerequisite: DH 422

DH 430 - Dental Hyg Board Review
Lecture Hours: 2
Lab Hours: 0
Credit Hours: 2
Designed to help students prepare for their national board exam. Multiple-choice test-taking skills practiced. Mock tests simulating the real exam are used.

DH 454 - Dental Prac Mgmt
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Profitability of the dental hygiene department; practice models, office design; patient satisfaction; financing options for the patient. Technology's impact on practice management.
Prerequisite: DH 323

DH 461 - Restorative Dentistry I
Lecture Hours: 1
Lab Hours: 3
Credit Hours: 2
Emphasis on restoration placement techniques. Practical experience using restorative dental materials. Placement and finishing of amalgam and composite restorations on typodonts in Restorative Dentistry I and on patients in Restorative II and III.
Prerequisites: DH 266, DH 352, and DH 363

DH 462 - Restorative Dentistry II
Lecture Hours: 1
Lab Hours: 3
Credit Hours: 2
Emphasis on restoration placement techniques. Practical experience using restorative dental materials. Placement and finishing of amalgam and composite restorations on typodonts in Restorative Dentistry I and on patients in Restorative II and III.
Prerequisite: DH 461

DH 463 - Restorative Dentistry III
Lecture Hours: 0
Lab Hours: 6
Credit Hours: 2
Emphasis on restoration placement techniques. Practical experience using restorative dental materials. Placement and finishing of amalgam and composite restorations on typodonts in Restorative Dentistry I and on patients in Restorative II and III.
Prerequisite: DH 462

DH 465 - Dental Hygiene Entrepreneurship
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Introduction to self-employed dental hygiene practice. Various practice opportunities are explored. Students develop and submit a detailed dental hygiene practice business plan.

DH 467 - Restorative Func Endorsement
Lecture Hours: 2
Lab Hours: 2
Credit Hours: 4
This course fulfills the Oregon Board of Dentistry (OBD) requirements for the restorative endorsement for dental assistants and dental hygienists. Lecture, lab practice on typodonts and clinical practice with patients. Additional testing is required by the OBD following course completion.
Prerequisite: AS or BS in Dental Hygiene or EFDA (Expanded Function Dental Assistant)

DH 470 - Community Program Planning I
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
First in a two course sequence. Students identify a target population and work with the community to assess, analyze, plan and budget for a community health project. Requires communication skills, networking, critical thinking and research.
Prerequisite: Admission to the BDHO program

DH 471 - Community Program Planning II
Lecture Hours: 1
Lab Hours: 6
Credit Hours: 3
Second course in Community Program Planning sequence. Community projects planned in DH 470 are implemented and evaluated.
Prerequisites: AHED 450, DH 470, and admission to the BDHO program

DH 475 - EBDM in Healthcare I
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
First in a two-course sequence. Course emphasizes evidence-based decision-making, identifying clinical treatment questions, describing types of research designs and sources of evidence, discussing importance of statistics, and conducting computerized searches. Critical appraisal of research introduced.
Prerequisite: Admission to the BDHO program

DH 476 - EBDM in Healthcare II
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Second in a two-course sequence. Emphasis on analysis of research studies for validity, reliability, statistical and clinical significance, and bias. Given clinical questions, students will conduct searches, critically analyze, and write summaries/reflections using EBDM guidelines.
Prerequisite: DH 475, MATH 243, and admission to the BDHO program

DH 477 - Dental Hyg Research Mthds III
Lecture Hours: 2
Lab Hours: 0
Credit Hours: 2
Third in a series of three courses focusing on evidence-based decision making and critical analysis of current literature. In small groups, students will research a clinical question in PICO format, conduct and analyze research, and write a systematic review.
Prerequisite: DH 476

DH 480 - Community Health Pract
Lecture Hours: 0
Lab Hours: 9
Credit Hours: 3
Students gain practical experience in public health by working in a public health setting. Individual goals and objectives are set by the student in consultation with the instructor.

Prerequisites: AHED 450, DH 471, and admission to the BDHO program

DH 495 - Individual Studies
Lecture Hours: 0
Lab Hours: 0
Credit Hours: 4
(Hours to be arranged each term.)

DH 499 - Laboratory Practice
Lecture Hours: 0
Lab Hours: 6
Credit Hours: 6
(Hours to be arranged each term.)

DHE 100 - Introduction to Dental Hygiene I
Lecture Hours: 2
Lab Hours: 0
Credit Hours: 2
Orientation to the theory and practice of all aspects of the dental hygiene profession. The history of dental hygiene, professional organization and career opportunities are discussed.

Diagnostic Medical Sonography

DMS 107 - Seminar
Lecture Hours: 0
Lab Hours: 0
Credit Hours: 15
(Hours to be arranged each term.)

DMS 207 - Seminar
Lecture Hours: 0
Lab Hours: 0
Credit Hours: 6
(Hours to be arranged each term.)

DMS 223 - App of Abdominal Sonogr I
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
History of sonography. Orientation to patient history, abdominal cross-sectional anatomy, scanning, and normal sonographic presentations.
Prerequisite: MIT 103 with grade "C" or better

DMS 224 - App of Abdominal Sonogr II
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Orientation to cross-sectional abdominal anatomy and pathology of organs and vessels. Procedures and techniques, including scanning.
Prerequisite: DMS 223 with grade "C" or better

DMS 225 - App of Abdominal Sonogr III
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Advanced abdominal scanning procedures and techniques. Emphasis on superficial structures invasive procedures and Doppler correlation, including scanning.
Prerequisites: DMS 224 and DMS 253 with grade "C" or better

DMS 234 - Pelvic Sonography
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Orientation to male and female pelvic cross-sectional anatomy and pathology, differentiating between normal variations and abnormalities to include first trimester obstetrics and trans-vaginal scanning.
Prerequisites: DMS 224 and DMS 253 with grade "C" or better

DMS 252 - Sophomore Lab I
Lecture Hours: 0
Lab Hours: 3
Credit Hours: 1
Applied scanning of right upper quadrant anatomy stressing imaging planes. Gray scale instrumentation, system-optimization, preventive maintenance, and quality hard copy imaging.
Prerequisite: Sophomore standing in the DMS program
Corequisite: DMS 223

DMS 253 - Sophomore Lab II
Lecture Hours: 0
Lab Hours: 3
Credit Hours: 1
Applied scanning of the remainder of the abdominal cavity stressing anatomy, standard imaging planes, and hard copy quality. Doppler instrumentation as applied to the cerebrovascular system stressing pulse wave Doppler, color Doppler, Doppler optimization and standard imaging planes. Imaging review of prior anatomical areas.
Prerequisites: BIO 335, DMS 223, and DMS 252, all with grade "C" or better
Corequisites: DMS 224 and MIT 231

DMS 254 - Sophomore Lab III
Lecture Hours: 0
Lab Hours: 3
Credit Hours: 1
DMS orientation to cross-sectional pelvic anatomy and pathology of the male and female pelvis. Procedures and techniques, including scanning.
Prerequisites: DMS 224 and DMS 253 both with grade "C" or better
Corequisite: DMS 225

DMS 307 - Seminar
Lecture Hours: 0
Lab Hours: 0
Credit Hours: 15
(Hours to be arranged each term.)

DMS 316 - Survey of Vascular Tech
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Orientation to vascular physics, equipment, and color flow imaging. Explanation of Doppler imaging in relation to vascular anatomy.
Prerequisites: DMS 234, DMS 235, and DMS 352, all with grade "C" or better

DMS 337 - Breast Sonography
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Breast sonographic scanning procedures with an emphasis on sonographic applications. Correlation with other imaging modalities.
Prerequisite: DMS 225 with grade "C" or better

DMS 343 - Neonatal/Pediatric Sonography
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Neonatal topics include hip, abdominal and neurological sonographic applications. General sonographic pediatric pathologies and anomalies will be discussed.

DMS 346 - Musculoskeletal Sonography
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Survey of sonographic musculoskeletal imaging with emphasis on normal and abnormal findings.
Prerequisite: DMS 225 with grade "C" or better

DMS 352 - Junior Lab I
Lecture Hours: 0
Lab Hours: 3
Credit Hours: 1
Topics to include the male/female pelvis, first trimester, musculoskeletal, and breast stressing sonographic anatomy, standard imaging planes, and image quality.
Prerequisite: DMS 254 with grade "C" or better

DMS 353 - Junior Lab II
Lecture Hours: 0
Lab Hours: 3
Credit Hours: 1
Topics to include normal first, second, third trimester, and cardiovascular stressing anatomy, standard imaging planes, and image quality.
Prerequisite: DMS 352 with grade "C" or better

DMS 354 - Junior Lab III
Lecture Hours: 0
Lab Hours: 3
Credit Hours: 1
Applied sonographic laboratory procedures and techniques. Emphasis on protocols and case reviews.
Prerequisite: DMS 353 with grade "C" or better

DMS 365 - Sonographic Pathology
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Differential diagnosis and concepts of disease processes as applied to sonographic examination.
Prerequisite: Junior standing in the DMS program

DMS 370 - Obstetrical Sonography
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Orientation to obstetrical scanning procedures and techniques. Emphasis on normal obstetrical anatomy and fetal development.
Prerequisites: DMS 224, DMS 225, and DMS 234 all with grade "C" or better

DMS 373 - Obstetrical Pathology
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Advanced obstetrical scanning of second and third trimester obstetrical patients with emphasis on pathology.
Prerequisite: DMS 370 with grade "C" or better

DMS 375 - Fetal Echocardiography
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Survey of fetal echocardiographic imaging applications with emphasis on parasternal, apical, subcostal and suprasternal 2-D views. Standard M- Mode measurements, Doppler and color Doppler. Common congenital cardiac pathology.

DMS 388 - Externship Preparation
Lecture Hours: 2
Lab Hours: 0
Credit Hours: 2
Presentation of key concepts related to Diagnostic Medical Sonography externship and required in-services. Focus is on patient care and interpersonal scenarios the externship student will likely face while in the clinical environment. Review and discussion of the DMS Externship Handbook.
Prerequisites: DMS 316, DMS 353, and DMS 370, all with grade "C" or better

DMS 407 - Seminar
Lecture Hours: 6
Lab Hours: 6
Credit Hours: 6
(Hours to be arranged each term.)

DMS 430 - DMS Externship
Lecture Hours: 0
Lab Hours: 0
Credit Hours: 15
All B.S. students must complete four terms (12 months) of clinical experience in sonography at an OIT approved clinical site. Students will work under the direct supervision of registered sonographers.
Prerequisite: All academic coursework in the DMS curriculum

DMS 430A - DMS Externship
Lecture Hours: 0
Lab Hours: 0
Credit Hours: 8
This two-term special externship is designed for the degree completion student. Students working in a clinical ultrasound setting will prepare clinical case studies.
Prerequisites: Be an ARDMS Sonographer in good standing and have completed all academic coursework in the Medical Imaging curriculum with grade "C" or better

DMS 430B - DMS Externship
Lecture Hours: 0
Lab Hours: 0
Credit Hours: 7
This two-term special externship is designed for the degree completion student. Students working in a clinical ultrasound setting will prepare clinical case studies.
Prerequisites: Be an ARDMS Sonographer in good standing and have completed all academic coursework in the Medical Imaging curriculum with grade "C" or better

Echocardiography

ECHO 107 - Seminar
Lecture Hours: 0
Lab Hours: 0
Credit Hours: 15
(Hours to be arranged each term.)

ECHO 207 - Seminar
Lecture Hours: 0
Lab Hours: 0
Credit Hours: 15
(Hours to be arranged each term.)

ECHO 227 - Basic ECG Recognition/Testing
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Basics of ECG testing, heart pressures, blood volume/physiology and the electrical conduction system. Focus on interpretation of ECG rhymes: normal ECG, ventricular hypertrophy, bundle branch block, AV block, myocardial ischemia, bradycardia, tachycardia, atrial fibrillation, ventricular fibrillation and irregular rhythms.

ECHO 231 - Echocardiography I
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
An introduction to scanning techniques and tomographic views according to the American Society of Echocardiography standards. B-mode image, pulsed and continuous wave Doppler, and color flow imaging.
Prerequisite: ECHO 320

ECHO 232 - Echocardiography II
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
An intermediate level of instruction in scanning techniques with tomographic views according to the American Society of Echocardiography standards. Emphasis on cardiac pathology and the echocardiography evaluation.
Prerequisite: ECHO 231

ECHO 307 - Seminar
Lecture Hours: 6
Lab Hours: 0
Credit Hours: 6
(Hours to be arranged each term.)

ECHO 320 - Cardiographic Methods
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Recognition of ECG tracing with normal and abnormal arrhythmias, treadmill testing, Holter monitoring, phonocardiography, and heart auscultation. Review of case examples for analysis and synthesis. Integration of cardiographic monitoring methods with cardiac ultrasound imaging. Review of cardiac anatomy.
Prerequisite: ECHO 232

ECHO 321 - Stress & Transesophageal Echo
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Cardiac applications, protocols, and techniques related to stress echo and transesophageal echo. TEE anatomy, acquisition of images and the cardiovascular operating room. Particular emphasis on the mitral valve and surgical repairs.
Prerequisite: Admission to the Echocardiography program

ECHO 325 - Pediatric Echo
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Congenital heart disease, including neonate/infant and adult disorders. Congenital disorders including cardiac situs, ventricular morphology, great artery connections, valvular and subvalvular obstruction, atrial septal defect, ventricular septal defect.
Prerequisite: ECHO 333

ECHO 332 - Invasive Cardiology
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Cardiac catheterization testing. Coronary artery interventions such as percutaneous transluminal coronary intervention (PCI), and chamber pressure measurements.
Prerequisite: ECHO 231

ECHO 333 - Echocardiography III
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
An advanced level of instruction in scanning techniques and tomographic views according to the American Society of Echocardiography standards. Cardiac pathology, and advanced methods in echocardiography.
Prerequisite: ECHO 232

ECHO 334 - Echocardiography IV
Lecture Hours: 3
Lab Hours: 3

Credit Hours: 4
An advanced level of instruction in scanning techniques and tomographic views according to the American Society of Echocardiography standards. Special topics including 3-D, 4-D, tissue Doppler, cardiac resynchronization and other technological advances.
Prerequisite: ECHO 333

ECHO 365 - Abdominal/Renal Testing
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Abdominal vascular anatomy and common disease processes. Students will be asked to perform basic abdominal vascular tests following very specific protocols and interpretations.
Prerequisites: ECHO 325 and ECHO 376
Corequisites: ECHO 385 and ECHO 388

ECHO 376 - Survey of Vascular Testing
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
Basic vascular pathophysiology in carotid, arterial, and venous testing. Waveform recognition, interpretation, and protocols for testing.
Prerequisite: ECHO 333

ECHO 385 - Echo Lab Management
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Focus on human resource skills as necessary to manage an echocardiography laboratory. Includes the interview process, hiring and firing, as well as employee performance evaluation. Other topics will include reimbursement, licensure, accreditation and other management issues.

ECHO 388 - Externship Preparation
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Review and summarization of key concepts in Echocardiography. Focus on patient care and interpersonal scenarios the student will likely face in the hospital environment or independent echo lab. Review and interpretation of case studies in preparation for clinical analysis and documentation using structured reporting systems. Review and discussion of the Echocardiography Externship Handbook.
Corequisite: ECHO 334

ECHO 407 - Seminar
Lecture Hours: 6
Lab Hours: 0
Credit Hours: 6
(Hours to be arranged each term.)

ECHO 420 - Echo Externship
Lecture Hours: 0
Lab Hours: 40
Credit Hours: 15
Students work as registered professionals in the field and must complete nine months (three quarters) of experience in Echocardiography.
Prerequisite: Admission to the Echocardiography Degree Completion program

ECHO 420A - Echo Externship
Lecture Hours: 0
Lab Hours: 22
Credit Hours: 8
Students work as registered professionals in the field. Patient echo exams with normal and abnormal stress tests, normal and abnormal wall motion. Case study presentation.
Prerequisite: Admission to the Echocardiography Degree Completion program

ECHO 420B - Echo Externship
Lecture Hours: 0
Lab Hours: 18
Credit Hours: 7
Students work as registered professionals in the field. Cardiac surgical echoes (TEE) and contrast studies using various pharmacological agents. Case study presentation.
Prerequisite: Admission to the Echocardiography Degree Completion program

ECHO 421 - Echo Senior Project
Lecture Hours: 4
Lab Hours: 0
Credit Hours: 4
Students design a research based senior project in the field of echocardiography, including interviews, research, literature review and formal presentation of the project.
Prerequisites: ECHO 420, and WRI 123 or WRI 227

Economics

ECO 107 - Seminar
Lecture Hours: 0
Lab Hours: 0
Credit Hours: 15
(Hours to be arranged each term.)

ECO 201 - Principles of Microeconomics
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Topics include scarcity, consumer choice, supply and demand, elasticity, cost and pricing theory, theory of market structures (competition, monopoly, monopolistic competition, oligopoly).
Prerequisite: MATH 100 or higher

ECO 202 - Principles of Macroeconomics
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
An introduction to the economic problem. Topics include gross domestic product, unemployment, monetary policy, fiscal policy, macro equilibrium, inflation, and supply and demand.
Prerequisite: MATH 100 or higher

ECO 203 - Prin of Econ-Spec Topics
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
A survey of micro- and macroeconomic topics of current interest. Topics may include labor practices, international economics, natural resource economics, urban planning, and economic policy issues. Students prepare a research paper and present results to the class.
Prerequisites: ECO 201 and ECO 202

ECO 207 - Seminar
Lecture Hours: 6
Lab Hours: 0
Credit Hours: 6
(Hours to be arranged each term.)

ECO 307 - Seminar
Lecture Hours: 6
Lab Hours: 0
Credit Hours: 6
(Hours to be arranged each term.)

ECO 357 - Energy Economics & Policy
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Explores the role of energy and energy resources from the economic perspective. Analyzes US and global energy markets and policy; traditional and alternative energy sources; pricing of externalities and public goods; the use of market instruments, subsidies and taxes; and the political economy.
Prerequisites: ECO 201 or ECO 202, and MATH 243 or MATH 361

ECO 367 - Int'l Economics & Finance Mgt
Lecture Hours: 4
Lab Hours: 0
Credit Hours: 4
Financial management involving international monetary environment; foreign exchange risk management; source and availability of funds to finance trade and multinational operations; taxation planning and control; international portfolio diversifications; international banking; capital budgeting; political risk evaluation of performance.
Prerequisites: BUS 308, and ECO 201 or ECO 202

ECO 407 - Seminar
Lecture Hours: 6
Lab Hours: 0
Credit Hours: 6
(Hours to be arranged each term.)

Electrical Engineering

EE 101 - Intro to Engineering I
Lecture Hours: 0
Lab Hours: 3
Credit Hours: 1

A three course sequence introducing the field of engineering focusing on electrical engineering and renewable energy. Success strategies. Engineering and scientific notation. Ohm's Law, problem solving. Communication skills. Ethics in engineering. Professional development and life-long learning. Introduction to the design process culminating in a term design experience.

EE 102 - Intro to Engineering II
Lecture Hours: 0
Lab Hours: 3
Credit Hours: 1
A three course sequence introducing the field of engineering focusing on electrical engineering and renewable energy. Success strategies. Engineering and scientific notation. Ohm's law, problem solving. Communication skills. Ethics in engineering. Professional development and lifelong learning. Introduction to the design process culminating in a team design experience.

EE 103 - Intro to Engineering III
Lecture Hours: 0
Lab Hours: 3
Credit Hours: 1
A three course sequence introducing the field of engineering focusing on electrical engineering and renewable energy. Success strategies. Engineering and scientific notation. Ohm's law, problem solving. Communication skills. Ethics in engineering. Professional development and life long learning. Introduction to the design process culminating in a team design experience.

EE 107 - Seminar
Lecture Hours: 0
Lab Hours: 0
Credit Hours: 15
(Hours to be arranged each term.)

EE 121 - Fund of Electric Circuits I
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
DC Analysis and First-Order transients. Ohm's Law, Kirchhoff’s laws, nodal analysis, mesh analysis, source transformations, Thévenin and Norton equivalents, maximum power transfer, superposition, introduction to op-amps, inductance and capacitance, transient response of RC and RL circuits.
Prerequisite: MATH 111

EE 123 - Fund of Electric Circuits II
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
AC analysis, second-order transients, introduction to electric power. Transient response of second-order circuits, sinusoids and phasors, sinusoidal steady-state analysis, nodal analysis, mesh analysis, source transformations, Thévenin and Norton equivalents, sinusoidal steady-state power calculations, balanced three-phase circuits, mutual inductance, transformers.
Prerequisites: EE 121 and MATH 112

EE 131 - Digital Electronics I
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Introduction to combinational logic, gates, Boolean Algebra, Karnaugh Mapping, Number Systems/Codes, arithmetic circuits, decoders/encoders, mux/demux, comparators, basic sequential gates (Latches/FF) and introduction to HDL (Verilog/VHDL), PLD HW implementation.
Pre- or Corequisite: MATH 111

EE 133 - Digital Electronics II
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Introduction to sequential logic with HDL, review latches and flip/flops, timers, counters/registers, HDL implementation, PLD HW implementation, finite state machine design/analysis, logic testing and timing analysis.
Prerequisites: EE 131 or CST 162 both with grade "C" or better, and MATH 111

EE 207 - Seminar
Lecture Hours: 10
Lab Hours: 0
Credit Hours: 10
(Hours to be arranged each term.)

EE 219 - Intro Semiconduct Device & Amp
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Introduction to semiconductor devices, characteristics of biasing of diodes and transistors, analysis and design of circuits using diodes, bipolar junction transistors and field-effect transistors. Applications of transistors as amplifiers and switches.
Prerequisite: EE 123

EE 221 - Circuits I
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
DC and AC principles and analysis. Ohm's law. Kirchhoff’s laws. Nodal analysis. Loop analysis. Source transformations. Thévenin and Norton equivalent circuits, maximum power transfer, operational amplifiers, inductance, capacitance, and first-order transient circuit response. Students must also register for a laboratory section.
Corequisite: MATH 252

EE 223 - Circuits II
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Single phase AC power. Transformers. Balanced three-phase power. Ideal op-amp. Basic op-amp circuits. First- and second-order circuits and transients. Steady-state frequency response. Bode plots. First- and second-order passive filters (LP, HP, BP). Resonance. Active op-amp filters.
Prerequisites: EE 221 and MATH 252, both with grade “C" or better

EE 225 - Circuits III
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Introductory course in linear circuit analysis. Transfer functions, frequency response, Bode plots, passive and active filter, Laplace transforms, Fourier series, Fourier transforms, and two-port networks. Students must also register for a laboratory section.
Prerequisite: EE 223 with grade "C" or better
Corequisite: MATH 321

EE 236 - LabVIEW Programming
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
An object oriented programming course using National Instruments LabVIEW programming language designed for programming data-logging, instrumentation and control applications. Basic flow-charting is introduced. Logical constructs as implemented by LabVIEW are investigated. Example control problems are investigated and programmed using LabVIEW.
Prerequisite: MATH 112

EE 307 - Seminar
Lecture Hours: 0
Lab Hours: 0
Credit Hours: 15
(Hours to be arranged each term.)

EE 311 - Signals and Systems
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Spectrum. Fourier Series. Time Frequency Spectrum. Sampling and Aliasing. Reconstruction. Sampling Theorem. Discrete Time Signals and Systems. Convolution Sum. Continuous Time Signals and Systems. Frequency Response. Continuous Time Fourier Transform. Relationship between CTFT, DTFT, DFT, and FFT. Spectrogram. Z Transform.
Prerequisite: EE 225 with grade "C" or better

EE 320 - Adv Circuit Systems Analysis
Lecture Hours: 4
Lab Hours: 3
Credit Hours: 5
Methods of circuit analysis and circuit theorems. Introduction to the Laplace transform and its applications. Advanced circuit analysis using Laplace transform techniques. Transfer function analysis. Impulse and frequency response of circuits and systems. Bode plots. Stability.
Prerequisites: EE 123 or EE 223, and MATH 252

EE 321 - Electronics I
Lecture Hours: 4
Lab Hours: 3
Credit Hours: 5
Basic semiconductor theory. Diodes and diode circuits. Bipolar-junction transistor (BJT). Ebers-Moll model. BJT amplifiers (CE, CB & CD). Multistage and differential amplifiers. Metal-Oxide-Semiconductor Field-Effect Transistor (MOSFET). MOSFET amplifiers (CS, CG & CD). Multistage MOSFET amplifiers. Op-Amps.
Prerequisites: EE 123 or EE 223, and MATH 252
Corequisites: EE 225 or EE 320

EE 323 - Electronics II
Lecture Hours: 4
Lab Hours: 3
Credit Hours: 5
Current sources. Current mirrors. Cascade active loads. Multistage amplifiers. Differential amplifiers. Frequency response. Miller's theorem. Negative feedback amplifier types: Voltage, Current, transconductance and transresistance. Stability and pole location. Gain and phase margins. Frequency compensation.
Prerequisites: EE 321 with grade "C" or better, and EE 225 or EE 320

EE 325 - Electronics III
Lecture Hours: 4
Lab Hours: 3
Credit Hours: 5
Real operational amplifiers and basic circuits. Output stages. Power amplifiers. Filters, passive and active. Oscillators. Wave-shaping circuits. D/A and A/D circuits.
Prerequisite: EE 323 with grade "C" or better

EE 331 - Digital System Design w/HDL
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Introduces the student to a Hardware Descriptive Language and describes its role in digital design. Dataflow, Behavioral and Structural Modeling, Logic Partitioning, Hierarchal Design, CPLDs, and FPGAs. DC parameters and CPLD Timing Models. Design examples including keyboard scanner, counters, ALUs, multipliers and controllers.
Prerequisite: EE 133 with grade "C" or better

EE 333 - Intro to Microcontrollers
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Introductory course in microcontroller design. Topic include interrupt controller, time/counters, A/D converters, PWM channels, USARTs, SPI, two-wire interfaces, LEDs, LCDs, motors, and various sensors. Hands-on projects or lab assignments require C and/or assembly language programming to develop applications.
Prerequisite: CST 116
Corequisite: EE 131 or EE 133 or EET 216

EE 335 - Advanced Microcontrollers
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Advanced course in design and development of micro-controller-based systems. Topics include internal peripheral devices, external devices interfacing, and micro-controller system design. Learning objectives are accomplished through design of fully integrated projects or lab assignments using C and/or assemble language programming.
Prerequisite: EE 333 with grade "C" or better

EE 341 - Electricity/Magnetism w/Transm
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Review vector calculus. Flux, potential, gradient, divergence, curl and field intensity. Static electric and magnetic fields. Maxwell's equations. Boundary conditions. Uniform plane waves in media and free space. Reflection and transmission at interfaces. Propagation of guided waves. Transmission line. Antennas.
Prerequisites: EE 123 or EE 221, MATH 252, MATH 254, and PHY 202 or PHY 222

EE 343 - Solid State Electronic Devices
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Crystal properties and growth of semiconductors. Atoms and electrons. Energy bands and charge carriers in semiconductors. Excess carriers in semiconductors, p-n junctions. FETs and BJTs. Optoelectronic devices. High-frequency and high-power devices.
Prerequisites: MATH 252, and PHY 202 or PHY 222
Corequisite: EE 321

EE 347 - Digital Logic
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Number systems; combinational logic including Boolean algebra, DeMorgan's Theorems and Karnaugh Maps; digital TTL, CMOS IC characteristics, conventional IC functions; sequential logic including flip-flops, counters, registers and state diagrams. Combinational and sequential logic circuits will be simulated, built and tested.
Prerequisite: MATH 112

EE 355 - Control System Design
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Continuous-domain systems and Laplace transform review. System modeling, identification and linearization. System response and stability analysis. Classical tracking and regulating controller design using computers. PID tuning, Lab exercises in modeling, design and implementation.

EE 401 - Communication Systems
Lecture Hours: 4
Lab Hours: 3
Credit Hours: 5
Signal Analysis, Fourier series, Fourier Transforms; analog signal transmission and Reception (AM, FM, PM); effects of noise in Analog Systems. Digital Data and Communication Systems; effects of noise in Digital Systems.
Prerequisite: EE 311 or EE 430

EE 407 - Seminar
Lecture Hours: 12
Lab Hours: 0
Credit Hours: 12
(Hours to be arranged each term.)

EE 419 - Power Electronics
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Power electronic device characterization. Rectifiers, DC-DC converters and inverters design, modeling, and build.
Prerequisite: EE 321

EE 421 - Analog Intgrted - Circuit Dsgn
Lecture Hours: 4
Lab Hours: 3
Credit Hours: 5
Models of IC active devices. Review single-transistor and multiple-transistor amplifiers. Current mirrors, active loads, and references. Output stages. Operational amplifiers with single-ended outputs. Frequency response of ICs, noise in ICs bipolar, MOS and BiCMOS IC technology. Student must register for laboratory section.
Prerequisite: EE 323
Corequisite: EE 325

EE 423 - CMOS Digital Intg Circuit Dsgn
Lecture Hours: 4
Lab Hours: 3
Credit Hours: 5
MOSFETs, threshold voltage, body effect, channel lengths, CMOS, inverter characteristics, transmission gates, performance (latch-up, parameter estimation, capacitance), domino logic, registers, scan test, layout.
Prerequisites: CST 133 or EE 133, and EE 321

EE 425 - Wireless Communication
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Baseband digital systems, messages, characters and symbols, sampling theorems. Noise sources, M-ary signals, baseband formatting including PCM waveforms, digital filters including FIR and IIR. Matched filters, band-pass modulation and demodulation techniques, and an introduction to spread spectrum

transmission. Student must register for laboratory section.
Prerequisites: EE 133/CST 133 and EE 223, both with grade "C" or better

EE 426 - RF/Wireless Systems
Lecture Hours: 4
Lab Hours: 3
Credit Hours: 5
Hardware components, system parameters, and architectures of RF and microwave wireless systems. Topics include microwave transmission lines, Smith charts, impedance matching networks, antenna systems, microwave components, receivers and transmitters, radar systems and sensors, and wireless communication systems.
Prerequisite: EE 341

EE 430 - Linear Sys & Digital Signal
Lecture Hours: 4
Lab Hours: 3
Credit Hours: 5
Introduction to signals and systems. Spectral analysis techniques. Fourier Series and the continuous-time Fourier transform (CTFT). Discrete-time Fourier transform (DTFT) and digital Fourier transform (DFT). Computational spectral analysis using the FFT. FIR and IIR filters. Z-transform. Practical implementation of digital filters and computational spectral analysis using MATLAB.
Prerequisite: EE 225 or EE 320

EE 431 - Digital Signal Processing
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Discrete systems and signals, linear time invariant systems, difference equations, frequency response, Z-transforms, analysis software, discrete Fourier transforms.
Prerequisites: EE 311 and EE 335, both with grade "C" or better

EE 432 - Advanced Digital System Design
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Advanced digital system design with Field Programmable Gate Arrays (FPGAs). Students implement designs with pre-generated and custom digital logic functions using VHDL and/or Verilog hardware description languages. Projects include digital systems design, simulations, and hardware implementation.
Prerequisites: CST 116 and EE 331, both with grade "C" or better

EE 441 - Biomedical I Intro Biomed Engr
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Introduction to biomedical engineering anatomy and physiology for engineers, bioelectric phenomena, biomedical sensors, biomedical instrumentation, biosignal processing, cardiovascular mechanics, biomaterials, tissue engineering, biomedical imaging and clinical engineering. Student must register for a laboratory section.
Prerequisite: EE 311 with grade "C" or better

EE 443 - Biomedical II Signal Procssng
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Fundamental problems of biomedical signal processing; signal analysis; signal modeling, sources and types of biomedical signals. Arterial and ambulatory blood pressure (ABP/ABPM); intracranial pressures (ICP); pulse oximetry (SpO2); electrocardiogram (ECG). Stochastic, harmonic models, spectrum analysis and time-frequency analysis. Student must register for a laboratory section.
Prerequisite: EE 311 with grade "C" or better

EE 445 - Biomedical III Instrumentation
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Review of biological systems (human), signals, measurements and transducers; bio-electrical signals and amplifiers; electrocardiograph (ECG); blood pressure; ultrasonography; x-ray; radiology and nuclear medicine equipment; power sources; electro-magnetic interference (EMI) effects; and electrical safety. Student must register for a laboratory section.
Prerequisite: EE 311 with grade "C" or better

EE 448 - Geometric Optics
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Reflection and refraction at plane and curved surfaces; imaging properties of lenses; first-order Gaussian optics and thin-lens system layout; matrix optics; ray-tracing software; spherical and chromatic aberrations.
Prerequisite: PHY 223

EE 449 - Radiometry & Optical Detect
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Fundamentals of radiometry and photometry; detection of light using thermal and photon (photoemissive, photoconductive, and photovoltaic) methods; noise processes; blackbodies; charge transfer devices; spectroradiometry.
Prerequisites: EE 223 and PHY 223

EE 450 - Physical Optics
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Spherical and planar waves; scalar diffraction theory; Fresnel and Fraunhofer diffraction and application to measurement; interference and interferometers; optical transfer functions; coherent optical systems and holography.
Prerequisite: PHY 223

EE 451 - Lasers
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Laser radiation properties, laser cavities, coherence, atomic spectra, pumping rate, power gain threshold conditions, beam shape, mode structure; Ion, molecular, solid-state, dye, semiconductor, and fiber lasers.
Prerequisite: EE 450 or PHY 450

EE 452 - Waveguides and Fiber Optics
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Light propagation in fibers and waveguides; termination, coupling, and splicing of fibers; fiber optic communication; optical time domain reflectometry, fiber amplifiers, and fiber sensors.
Prerequisite: EE 450 or PHY 450

EE 453 - Optical Metrology
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Modern optical metrology with emphasis on non-destructive testing; Fourier optics; Moiré and polarization methods; classic and holographic interferometry; speckle techniques; fringe analysis.
Prerequisite: EE 450 or PHY 450

EE 461 - Control Engineering I: Classical Methods
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
An introduction to the design and compensation of linear control systems using a complex frequency-domain approach. Feedback control of first- and second-order systems, controller sensitivity, disturbance rejection, stability, frequency response methods. Introduction to state-space modeling. Computer simulation of feedback control systems.
Prerequisites: EE 225 or EE 320, ENGR 267, and MATH 321, all with grade "C" or better. Engineering majors who have completed MECH 326 and MECH 480, both with grade "C" or better, may also enroll.

EE 465 - Sensors and Instrumentation
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Advanced course in sensors and instrumentation for embedded applications. Topics include a study of transducers, medical sensors, position sensors, automotive sensors, and sensor arrays. Students will also study sensor synchronization, A/D converters, linearization, sampling, error sources/budget, and noise margin analysis.
Prerequisite: EE 331 with grade "C" or better
Corequisite: PHY 223

EE 471 - Machine Learning I
Lecture Hours: 4
Lab Hours: 0
Credit Hours: 4
Theory and practice of Genetic Algorithms, Evolution Strategies, Backprop, Kernel Methods, Naive Bayes, Bayesian Belief Nets, Fuzzy Inference; brief discussion of Genetic Programming, Swarm Intelligence, Reinforcement Learning, Bayes Optimal.
Prerequisite: EE 430, or CST 116 and MATH 341, or ENGR 267 and MATH 341

EE 473 - Machine Learning II
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Integration of Information Theory and Statistical Learning into a generalized framework including Support-Vector Machines, Adaptive Resonance, and Adaptive Critics, plus project.
Prerequisite: EE 471

EE 475 - Micropower Systems
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Advanced course in low-power solutions for embedded systems. Topics will include low-power processor architectures, power management subsystems, processor sleep modes, power circuits, power supply sequencing, battery technology, rechargeable power sources, charge capacity models, IoT applications.
Prerequisite: EE 323 with grade "C" or better

EE 485 - Printed Circuit Board Design
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
A course on modern PCB technology and design skills required for successful implementation of PCB designs in industry. This course provides direct, hands-on experience with industry standards, tools, and design techniques. Students will learn schematic capture and PCB layout. Cross-listed with EE 585.
Prerequisites: EE 335 and EE 341, both with grade "C" or better

EE 501 - Communication Systems
Lecture Hours: 3
Lab Hours: 4
Credit Hours: 5
Single Analysis, Fourier series, Fourier Transforms; Analog signal transmission and Reception (AM, FM, PM); effects of noise in Analog Systems. Digital Data and Communication Systems; effects of noise in Digital Systems. Cross-listed with EE 401.
Prerequisite: Graduate standing

EE 507 - Seminar
Lecture Hours: 12
Lab Hours: 12
Credit Hours: 12
(Hours to be arranged each term.)

EE 525 - Wireless Communications
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Baseband digital systems, messages, characters and symbols, sampling theorems. Noise sources, M-ary signals, baseband formatting including PCM waveforms, digital filters including FIR and IIR. Matched filters, band-pass modulation and demodulation techniques, and an introduction to spread spectrum transmission. Cross-listed with EE 425.
Prerequisite: Graduate standing

EE 526 - RF/Wireless Systems
Lecture Hours: 4
Lab Hours: 3
Credit Hours: 5
Hardware components, system parameters, and architectures of RF and microwave wireless systems. Topics include microwave transmission lines, Smith charts, impedance matching networks, antenna systems, microwave components, receivers and transmitters, radar systems and sensors, and wireless communication systems.
Prerequisite: Graduate standing

EE 530 - Linear Sys & Digital Sig Prcsg
Lecture Hours: 4
Lab Hours: 3
Credit Hours: 5
Introduction to signals and systems. Spectral analysis techniques. Fourier Series and the continuous-time Fourier transform (CTFT). Discrete-time Fourier transform (DTFT) and digital Fourier transform (DFT). Computational spectral analysis using the FFT. FIR and IIR filters. Z-transform. Practical implementation of digital filters and computational spectral analysis using CAD tools.

EE 532 - Advanced Digital System Design
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Advanced digital system design with Field Programmable Gate Arrays (FPGAs). Students implement designs with pre-generated and custom digital custom logic functions using VHDL and/or Verilong hardware description languages. Projects include digital system design, simulation, and hardware implementation. Cross-listed with EE 432.
Prerequisite: MSE Graduate standing

EE 535 - Embedded Systems Hardware
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Advanced course in embedded systems hardware design and development. Topics include system-on-chip design, ARM processor architecture, digital signal processors, multicore processing, vector processors, graphics processing units, external serial interfaces, external memory interfaces, network interfaces, debuggers, in-circuit emulators, and hardware security. Cross-listed with EE 435
Prerequisite: MSE Graduate standing

EE 548 - Geometric Optics
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Reflection and refraction at plane and curved surfaces; imaging properties of lenses; first-order Gaussian optics and thin-lens system layout; matrix optics; ray-tracing software; spherical and chromatic aberrations.
Prerequisite: PHY 223

EE 549 - Radiometry & Optical Detection
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Fundamentals of radiometry and photometry; detection of light using thermal and photon (photoemissive, photoconductive, and photovoltaic) methods; noise processes; blackbodies; charge transfer devices; spectroradiometry.
Prerequisite: PHY 223

EE 550 - Physical Optics
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Spherical and planar waves; scalar diffraction theory; Fresnel and Fraunhofer diffraction and application to measurement; interference and interferometers; optical transfer functions; coherent optical systems and holography.
Prerequisite: PHY 223

EE 551 - Lasers
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Laser radiation properties, laser cavities, coherence, atomic spectra, pumping rate, power gain, threshold conditions, beam shape, mode structure; ion, molecular, solid-state, dye, semiconductor, and fiber lasers.
Prerequisite: EE 450/PHY 450 or EE 550/PHY 550

EE 553 - Optical Metrology
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Modern optical metrology with emphasis on non-destructive testing; Fourier optics; Moiré and polarization methods; classic and holographic interferometry; special techniques; fringe analysis.
Prerequisite: EE 450/PHY 450 or EE 550/PHY 550

EE 555 - Embedded Systems Software
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Advanced course in embedded systems software design and development. Topics include bootloaders, embedded operating systems (RTOS, Embedded Linux), memory management systems, file systems,

device drivers, integrated development environments (Eclipse, Compliers/Linkers/Makefiles), software revision control, and embedded programming (C++). Cross-listed with EE 455
Prerequisite: MSE Graduate standing

EE 560 - Computational Data Science & Big Data
Lecture Hours: 4
Lab Hours: 0
Credit Hours: 4
Applied data science, statistical techniques for data science, applied machine learning, big data analysis, big data processing, visualization and representation, applied computational & mathematical methods for data science, data analytics, applied text mining and network analysis.
Prerequisite: Graduate standing

EE 561 - Control Engineering I: Classical Methods
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
And introduction to the design and compensation of linear control systems using a complex frequency-domain approach. Feedback control of first- and second-order systems, controller sensitivity, disturbance rejection, stability, frequency response methods. Introduction to state-space modeling. Computer simulation of feedback control systems.
Prerequisite: Graduate standing

EE 565 - Sensor and Instrumentation
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Advanced course in sensors and instrumentation for embedded applications. Topics include a study of transducers, medical sensors, position sensors, automotive sensors, and sensor arrays. Students will also study sensor synchronization, A/D converters, linearization, sampling, error sources/budget, and noise margin analysis. Cross-listed with EE 465.

EE 575 - Micropower Systems
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Advanced course in low-power solutions for embedded systems. Topics will include low power processor architectures, power management subsystems, processor sleep modules, power circuits, power supply sequencing, battery technology, rechargeable power sources, charge capacity models, IoT applications. Cross-listed with EE 475.
Prerequisite: MSE Graduate standing

EE 585 - Printed Circuit Board Design
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
A course on modern PCB technology and design skills required for successful implementation of PCB designs in industry. This course provides direct, hands-on experience with industry standards, tools, and design techniques. Students will learn schematic capture and PCB layout. Cross-listed with EE 485.
Prerequisite: MSE Graduate standing

EE 595 - Selected Grad Topics in EE
Lecture Hours: 4
Lab Hours: 0
Credit Hours: 4
Selected electrical, computer, and embedded engineering topics at the graduate level. Course may be repeated for credit.

EE 596 - Grad Research & Development
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Research and development in electrical, computer, and embedded engineering topics at the graduate level. Course may be repeated for credit.

EE 597 - Graduate Project
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Graduate project in electrical, computer, and embedded engineering topics. Course may be repeated for credit.

EE 598 - Graduate Thesis
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Graduate thesis in electrical, computer, and embedded engineering topics. Course may be repeated for credit.

EE 599 - Practicum
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Supervised practical experience in electrical, computer, and embedded engineering topics at the graduate level. Course may be repeated for credit.

Electronics Engineering Technology

EET 215 - Digital Circuits I
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Introduction to combinational logic, gates, Boolean algebra. Karnaugh mapping, number systems/codes, arithmetic circuits, encoders/decoders, multiplexers/demultiplexers, comparators, parity, code conversions, introduction to HDL, PLD HW implementation.
Prerequisite: MATH 111

EET 216 - Digital Circuits II
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Introduction to sequential logic, latches, flip-flops, timers, counters, registers, finite state machines, logic testing, DC parameters and timing analysis.
Prerequisite: EET 215

EET 217 - Electric Circuits I
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
DC Analysis and First-Order Transients. Ohm's law, Kirchhoff's laws, nodal analysis, mesh analysis, source transformations, Thévenin and Norton equivalents, maximum power transfer, superposition, introduction to op-amps, inductance and capacitance, transient response of RC and RL circuits.
Prerequisite: MATH 111

EET 218 - Electric Circuits II
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
AC Analysis, Second-Order Transients, introduction to electric power. Transient response of second-order circuits, sinusoids and phasors, sinusoidal steady-state, nodal analysis, mesh analysis, source transformations, Thévenin and Norton equivalents, sinusoidal steady-state power calculations, balanced three-phase circuits, mutual inductance, transformers.
Prerequisites: EET 217 and MATH 112

EET 219 - Semiconductor Devices & Amp
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Introduction to semiconductor devices, characteristics and biasing of diodes and transistors, analysis and design of circuits using diodes, bipolar junction transistors, and field-effect transistors. Applications of transistors as diodes and switches.
Prerequisite: EET 218

EET 237 - AC Circuits, Filters & Signals
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
RC transient analysis, sinusoidal AC voltage, phasors, average and effective value, the decibel, simple RC transfer functions. Low-pass, high-pass, and band-pass filters, periodic and aperiodic signals in time and frequency, bandwidth. For non-EET majors.
Prerequisites: EE 221 or EET 115 with grade "C" or better, and MATH 252
Corequisite: EET 238

EET 238 - AC Circuits, Filters Lab
Lecture Hours: 0
Lab Hours: 3
Credit Hours: 1
Lab to accompany EET 237. For non-EET majors.
Prerequisites: EE 221 or EET 115 with

grade "C" or better, and MATH 252
Corequisite: EET 237

EET 308 - Intro MOS Microelctrncs
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Introduction to microelectronics, semiconductor physics, integrated circuit (IC) technology, pn junction and MOS (Metal-Oxide-Semiconductor) electrostatics, MOS FETs (Field-Effect Transistors), selected digital circuits using CMOS (Complementary MOS) FETs, PSPICE modeling of IC MOSFETs.
Prerequisites: CST 262 and EET 237, or instructor consent
Corequisite: EET 309

EET 309 - Intro MOS Microelec Lab
Lecture Hours: 0
Lab Hours: 3
Credit Hours: 1
Laboratory companion to EET 308. Theoretical concepts discussed in lecture verified using available components and instrumentation. Computer simulation using PSPICE. Written and oral laboratory reports required.
Prerequisites: CST 262, and EET 238 or EET 246, or instructor consent
Corequisite: EET 308

Emergency Medical Technology-Paramedic

EMS 107 - Seminar
Lecture Hours: 10
Lab Hours: 0
Credit Hours: 10
(Hours to be arranged each term.)

EMS 115 - Introduction to EMS
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Introduces the fundamentals of an emergency medical services system, history, and professional roles and responsibilities. Discusses medical/legal and ethical issues, research and evidence based practice.

EMS 135 - Wilderness First Aid
Lecture Hours: 1
Lab Hours: 0
Credit Hours: 1
Basic First Aid and CPR training for the outdoor adventurer or world traveler. Scenario-based learning using medical equipment improvised for wilderness settings. Course completion earns Wilderness First Aid and CPR certifications meeting the outdoor industry requirements. Customized group courses available.

EMS 151 - Emerg Med Tech (EMT) I
Lecture Hours: 3
Lab Hours: 9
Credit Hours: 6
The first of two courses required for an entry-level career in emergency medical services. the course introduces students to the EMS system, professional attributes of an EMT, ambulance operations and the basic knowledge and skills of an EMT.
Prerequisite: Current CPR certification

EMS 152 - Emerg Med Tech (EMT) II
Lecture Hours: 3
Lab Hours: 9
Credit Hours: 6
The second of two course focuses on the basic recognition and treatment of specific illnesses and injuries. The course includes 16-hours clinical and ambulance experience. Students successfully completing the course are eligible for Oregon and national certification examinations.
Prerequisite: EMS 151

EMS 190 - EMT Externship
Lecture Hours: 0
Lab Hours: 12
Credit Hours: 4
EMS field experience with an affiliated transport agency. Students work at a BLS level under the direct supervision on one of the local EMS agency ambulances.
Prerequisite: EMS 152 or Oregon EMT certification

EMS 200 - Medical Terminology
Lecture Hours: 0
Lab Hours: 0
Credit Hours: 3
Students build a strong medical vocabulary using prefixes, suffixes, and Greek and Latin verbs and adjectives. Students learn anatomical roots and examine anatomical structures, disease, procedures, tumors, and descriptive terms using simple word analysis.

EMS 207 - Seminar
Lecture Hours: 10
Lab Hours: 0
Credit Hours: 10
(Hours to be arranged each term.)

EMS 211 - Prehospital Emerg Pharmacology
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Lectures relating specific emergencies to the types of medications used for treatment. Includes classifications, actions, indications, administration and dosages, precautions and side effects of each of the medications used in prehospital treatment of medical and traumatic emergencies. In addition, students learn common prescription medications found in the home.
Prerequisite: CHE 210

EMS 218 - Trauma Emergencies
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Introduces the epidemiology and kinematics of trauma, and integrates the assessment findings with pathophysiology in the management of the acutely injured patient. Discusses considerations for special patient populations and includes a Prehospital Trauma Life Support Course.

EMS 231 - Medical Emergencies
Lecture Hours: 4
Lab Hours: 0
Credit Hours: 4
The first in a series of three courses addressing the epidemiology and pathophysiology of various medical complaints; integrates assessment findings with the formulation of a treatment plan for the acute illness.

EMS 232 - Medical Emergencies II
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
A continuation of the series of three courses addressing the epidemiology and pathophysiology of various medical complaints; integrates assessment findings with the formulation of a treatment plan for the acute illness.
Prerequisite: EMS 231

EMS 233 - Medical Emergencies III
Lecture Hours: 2
Lab Hours: 0
Credit Hours: 2
The conclusion of the sequence in medical emergencies where the epidemiology, pathophysiology and assessment findings are integrated to form a treatment plan for acute illnesses in the emergency setting.
Prerequisite: EMS 232

EMS 235 - Basic Electrocardiography
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Fundamentals of electrocardiography and interpretation of normal and abnormal ECG patterns. Normal and abnormal wave patterns, presentation and treatment of common cardiac diseases.

EMS 236 - Advanced Electrocardiography
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Building upon basic EKG knowledge, this course advances into 12-lead EKG interpretation and prehospital treatment. Focusing on signs and symptoms of ischemia or infarction, axis deviation, and other EKG anomalies, students learn about various treatment modalities.

EMS 237 - Paramedic 12-Leads
Lecture Hours: 1
Lab Hours: 0
Credit Hours: 1
Building upon knowledge that was presented in EMS 236, this course explores 12-lead ECG interpretation further, and specifically how this skill can be used by paramedics.
Prerequisite: EMS 236

EMS 241 - Paramed Crisis Resrce Mgmt I
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
The first in a series of 3 courses addressing human factors contribution to EMS scene management. PCRM I focuses on human error, perception modalities, human emotion and motivation, and teamwork theory.

EMS 242 - Paramed Crisis Resrce Mgmt II
Lecture Hours: 1
Lab Hours: 0
Credit Hours: 1
The second course in a series of 3 addressing the theory and practice of human factors contribution to EMS scene management. PCRM II focuses on the following human factor contributions to scene performance; review of acute healthcare environment challenges, cognitive attention, and crisis communication strategies.
Prerequisite: EMS 241

EMS 243 - Paramed Crisis Resrce Mgmt III
Lecture Hours: 1
Lab Hours: 0
Credit Hours: 1
The third class in a series of 3 courses addressing the theory and practice of human factors contribution to EMS scene management. PCRM III focuses on the following human factor contributions to scene performance; stress and coping on decision-making, on-scene leadership characteristics, and organizational influences on error.
Prerequisite: EMS 242

EMS 271 - Paramedic Skills Lab I
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
The first of three courses reviews EMT level skills and introduces the advanced level paramedic skills. Students learn safe and effective skills performance and begin to integrate assessment, management and skills performance.

EMS 272 - Paramedic Skills Lab II
Lecture Hours: 1
Lab Hours: 3
Credit Hours: 2
The second course in the series continues the development of advanced level skills proficiency. Students integrate knowledge of specific patient complaints with assessment and management skills.
Prerequisite: EMS 271

EMS 273 - Paramedic Skills Lab III
Lecture Hours: 0
Lab Hours: 3
Credit Hours: 1
This course is designed to strengthen the students team lead abilities and to enhance critical thinking and decision making skills through scenario based skills practice sessions. Students prepare for national certification practical exam stations.
Prerequisite: EMS 272

EMS 283 - Clinical Practicum I
Lecture Hours: 0
Lab Hours: 18
Credit Hours: 6
Focusing on the emergency medical practices of a paramedic, students integrate classroom studies into clinical practices while working under the direct supervision of health care professionals.
Prerequisites: CHE 210, EMS 218, EMS 231, EMS 235, EMS 241, and EMS 271

EMS 284 - Clinical Practicum II
Lecture Hours: 0
Lab Hours: 18
Credit Hours: 6
Students integrate knowledge and skills with patient care practices as they rotate through clinical experience in a variety of medical specialties. Students work under the direct supervision of health care professionals in each medical specialty.
Prerequisites: CHE 210, EMS 218, EMS 231, EMS 235, EMS 241, and EMS 271

EMS 291 - Pramed Field Extern Practic I
Lecture Hours: 0
Lab Hours: 12
Credit Hours: 4
The first of two field experience courses with an affiliated advanced life support agency. Students complete an orientation to the field and work under the direct supervision of a paramedic preceptor responding to 911 emergency calls.

EMS 292 - Paramed Field Extern Prac II
Lecture Hours: 0
Lab Hours: 36
Credit Hours: 12
The continuation of the field experience courses with an affiliated advanced life support agency. Students work in the field and work under the direct supervision of a paramedic preceptor responding to 911 emergency calls.
Prerequisite: EMS 291

EMS 321 - Community Paramedic I
Lecture Hours: 4
Lab Hours: 0
Credit Hours: 4
First course in a two course series addressing the management of chronic illness, social service connection, and healthcare system navigation as it relates to the prehospital environment.
Prerequisite: Current National or State Paramedic Certification

EMS 322 - Community Paramedic II
Lecture Hours: 4
Lab Hours: 0
Credit Hours: 4
Second course in a two course series addressing the management of chronic illness, social service connection, and healthcare system navigation as it relates to the prehospital environment.
Prerequisite: Current National or State Paramedic Certification

EMS 331 - Critical Care Transport
Lecture Hours: 4
Lab Hours: 0
Credit Hours: 4
The first of two courses is designed to prepare paramedics to provide advanced critical care during transports, including performing advanced clinical patient assessments and providing invasive care beyond the standard scope of advanced pre-hospital care.
Prerequisite: Paramedic credentials or instructor consent

EMS 332 - Critical Care Transport II
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
The second of two courses is designed to prepare paramedics to provide advanced critical care during transports, including performing advanced clinical patient assessments and providing invasive care beyond the standard scope of advanced pre-hospital care.
Prerequisites: EMS 331 and EMS 381

EMS 341 - Community Para Clinical I
Lecture Hours: 0
Lab Hours: 6
Credit Hours: 2
The first course in a series of two courses addressing the management of chronic illness, social service connection, and healthcare system navigation as it relates to the prehospital environment. This course focuses on the management of chronic/sub-acute illness.
Prerequisite: Current National or State Paramedic Certification
Corequisite: EMS 321

EMS 342 - Community Para Clinical II
Lecture Hours: 0
Lab Hours: 6
Credit Hours: 2
The second course in a series of two courses addressing the management of chronic illness, social service connection, and healthcare system navigation as it relates to the prehospital environment. This course focuses on the management of chronic/sub-acute illness.
Corequisite: EMS 322

EMS 381 - Crit Care Clin Pract I
Lecture Hours: 0
Lab Hours: 3
Credit Hours: 1
The first of two practicum classes that exposes students to critical care transport topics focusing on psychomotor skills and the science behind them. This practicum is designed to prepare the student for EMS 382 ICU and critical care transport experience.
Corequisite: EMS 331

EMS 382 - Crit Care Clin Pract II
Lecture Hours: 0
Lab Hours: 9
Credit Hours: 3
The second of two practicum classes that exposes students to critical care transport environments that may include experiences with intensive care units, fixed wing transport, rotor wing transport, critical care ground transport, as well as various specialty critical care teams.
Prerequisite: EMS 331
Corequisite: EMS 332

EMS 444 - EMS Systems, Lead & Mgt
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Explores the fundamental skills of managing and leading in EMS: concepts, principles and practices of leaders in the EMS industry. Case study discussions and analysis. Examines EMS systems, operations, resources and regulation of EMS. Industry leaders provide guest lectures.
Prerequisites: BUS 317 and PSY 347

EMS 456 - Research Methods in EMS
Lecture Hours: 2
Lab Hours: 0
Credit Hours: 2
An introductory course in EMS research covering hypothesis formulation, design and use of data-gathering instruments, data collection, and methods of data analysis and presentation. Research and technical reports appearing in professional publications and archives are examined.
Prerequisite: MATH 361

EMS 496 - EMS Capstone Project I
Lecture Hours: 1
Lab Hours: 6
Credit Hours: 3
Students formulate a detailed plan for a project or independent research study within the EMS industry. Project plan will include topic outline and goals, timeline, industry contacts. Faculty advisor will be assigned.
Prerequisites: MATH 361 and WRI 227

EMS 497 - EMS Capstone Project II
Lecture Hours: 1
Lab Hours: 6
Credit Hours: 3
Implementation and completion of student project planned in EMS 496. Project results to be delivered in a report presented to an audience of EMS peers. Students will have scheduled meeting with a faculty advisor to track progress and determine readiness for presentation.
Prerequisite: EMS 496

Engineering

ENGR 101 - Intro to Engineering I
Lecture Hours: 1
Lab Hours: 3
Credit Hours: 2
Introduces the student to engineering with a focus on academic success, professional development, ethics, communication, and creative problem solving techniques, engineering tools (CAD/CAE), and design concepts. A discipline-specific team-based laboratory experience encourages consideration of a chosen engineering discipline.

ENGR 102 - Intro to Engineering II
Lecture Hours: 1
Lab Hours: 3
Credit Hours: 2
The student will focus on their chosen discipline through an interdisciplinary team-based design project including problem identification, measurement, analysis, and presentation to peers. Emphasis will be placed on proper usage of engineering tools and instruments and sound design practices.
Prerequisite: ENGR 101

ENGR 111 - MMET Orientation
Lecture Hours: 1
Lab Hours: 3
Credit Hours: 2
Topics include: survey of the engineering profession, educational and professional development, standards of practice; engineering information, calculations, and analysis. An engineering design project will be incorporated. This course provides knowledge and skills to engineering students, which will benefit their future academic and professional endeavors.
Prerequisite: Declared major in the BSME, BSMET, or BSMFG program

ENGR 120 - Fundamentals of Engineering Design, Analytical Tools, and CAD
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
Fundamentals of engineering design, including analytical and computational tools that introduce design concepts and build a foundation of engineering knowledge that will be helpful to students starting off in engineering and technology disciplines. Computer aided design and drafting, problem solving, documentation, analysis, teamwork, and multi-step engineering calculations.

ENGR 121 - Engineering Principles and Problem Solving
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
Topics include modeling of real-world concepts and systems, basic statics, electronics, energy generation, and robotics. Using both analytical and computational tools to represent, analyze, and improve on real-world situations. Identifying the correct type of system to employ, improving the efficiency of existing systems, working in multi-disciplinary groups, developing and presenting ideas, prototyping as well as testing iteratively.

ENGR 122 - Electronics and Computation in Engineering
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
Fundamental electrical and computational topics in engineering. Building and analyzing circuits, using mathematical concepts to develop solutions, and using both analytical and computational tools to gain knowledge and hands-on skills. Troubleshooting and testing of ideas as well as presenting ideas in an organized and systematic manner to others. Provides a basic foundation of knowledge and skills that will transfer well to continued education, technical jobs and self-confidence.

ENGR 207 - Seminar
Lecture Hours: 6
Lab Hours: 6
Credit Hours: 6
(Hours to be arranged each term.)

ENGR 211 - Engineering Mechanics: Statics
Lecture Hours: 4
Lab Hours: 0
Credit Hours: 4
Fundamental principles of mechanics of rigid bodies and the application of these principles to engineering problems.
Prerequisite: PHY 201 or PHY 221
Pre- or Corequisite: MATH 252

ENGR 212 - Engineering Mech: Dynamics
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Kinematics of particles and rigid bodies. Kinetics of particles and rigid bodies in plane motion, including Newton's second law, work and energy, and impulse and momentum.
Prerequisites: ENGR 211 and MATH 252

ENGR 213 - Engr Mech: Strength of Mat
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Internal stresses and deformations of structural members and machines when subjected to external forces.
Prerequisites: ENGR 211 and MATH 252

ENGR 236 - Fund of Elec Circuits
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Resistive circuits, operational amplifiers, capacitors, inductors, transient analysis, sine waves, AC circuit analysis, resonance, transformers. Not for Electronics Engineering Technology and Computer Engineering Technology students.
Prerequisites: MATH 252, and PHY 202 or PHY 222

ENGR 266 - Engineering Computation
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
Programming and problem solving using current computer software. General programming techniques using conditional statements, looping, subroutines, and data input/output will be stressed. Consideration of features specific to the software being used will also be presented.
Prerequisite: MATH 112

ENGR 267 - Engineering Programming
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
Computer programming principles. Control structures. Structural programming principles. Functions and scripts. MATLAB programming. LabVIEW programming. Application of engineering programming principles in projects.
Prerequisite: MATH 251

ENGR 305 - Nanoscience & Nanotech
Lecture Hours: 4
Lab Hours: 0
Credit Hours: 4
Survey of chemical and physical phenomena as applied to nanoscale materials, including metal and semiconductor nanoparticles and carbon nanostructures. Discussion of major synthesis and characterization techniques. Biological and engineering applications of nanoscale materials.
Prerequisites: CHE 202 or CHE 222, and PHY 222 or PHY 223

ENGR 318 - Engineering Mech: Fluids
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Fundamental properties of fluids, fluid statics and pressure variation, flow characterization, momentum and forces due to fluid motion, energy of fluids in motion, and flow in conduits. Emphasis on civil and mechanical engineering applications of fluid mechanics principles.
Prerequisites: ENGR 211 and MATH 252

ENGR 326 - Electric Power Systems
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
Study related to theory and application of industrial electric power systems. Topics covered include transformers, motors, generators, motor controls, and protective devices.
Prerequisite: ENGR 236

ENGR 355 - Thermodynamics
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
An introductory course in thermodynamics, the science of heat energy conversion. Develops understanding of energy, heat, work, efficiency, and ideal thermodynamic cycles. Teaches first and second laws of thermodynamics and perfect gas law.
Prerequisites: MATH 252, and PHY 202 or PHY 222

ENGR 407 - Seminar
Lecture Hours: 12
Lab Hours: 0
Credit Hours: 12
(Hours to be arranged each term.)

ENGR 415 - Occupational Safety
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
Topics include current occupational safety and health issues. Practical application of regulations in the industrial setting. Compliance to Industrial Hygiene and General Safety Standards. Common safety violations and implementation of safety programs.
Prerequisite: Junior standing in any MMET program

ENGR 422 - Process Control
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Design of continuous and batch process control systems. Advanced control schemes, including model-based methods.
Prerequisite: ENGR 464

ENGR 445 - Engineering Project Management
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Applications of the Critical Path Method to organization and control of engineering projects. Applications software will be used to create and evaluate project networks to develop management reports.
Prerequisite: Junior standing in Engineering or Engineering Technology

ENGR 461 - Modeling and Simulation of Dynamic Systems
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Conservation laws of physics are used to develop lumped-parameter models of continuous-time dynamic systems. Modeling and analysis of engineering systems containing mechanical, electrical, electromechanical, fluid, and thermal components. Computational methods are used to simulate a range of practical engineering problems.
Prerequisites: EE 225 or EE 320, ENGR 267, MATH 321, MATH 322 or MATH 341, and PHY 223, all with grade "C" or better. Mechanical Engineering majors who have completed MECH 326 and MECH 480, both with grade "C" or better may enroll without having completed EE 225 and/or EE 320.

ENGR 462 - Control Engineering II: Modern Methods
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Modeling, simulation, and control of continuous and discrete processes using state-space methods. State functions, state equations, transfer matrices. State-space model building, state-feedback control and observation, pole placement, state vector transformations. Discrete-time control systems.
Prerequisites: EE 461 and ENGR 461, both with grade "C" or better

ENGR 463 - Motion Control in Mechanisms and Robotics
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Motion control components, beginning with the study of the function, classification, position, velocity, and acceleration of fundamental mechanisms and robot kinematic chains. Dynamic response of open- and closed-loop mechanisms to periodic and non-periodic loading. Motion and torque control.
Prerequisite: ENGR 461 with grade "C" or better

ENGR 464 - Autonomous Systems
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
A capstone course in the Robotics, Control, and Autonomous Systems Engineering sequence. A unified treatment using dynamics, modeling, simulation, and control in the analysis and synthesis of autonomous control systems.
Prerequisites: ENGR 462 and ENGR 463, both with grade "C" or better

ENGR 465 - Capstone Project
Lecture Hours: 0
Lab Hours: 6
Credit Hours: 2
Students apply material learned in other courses, develop expertise on a specific topic, work closely with a faculty member to implement the project, and improve professional communication skills by writing a project report. Course may be repeated for credit.
Prerequisites: Junior standing and instructor consent

ENGR 485 - Fund of Engineering Exam Prep
Lecture Hours: 1
Lab Hours: 0
Credit Hours: 1
A preparation course covering the requirements of, and providing a review for, the NCEES FE exam.
Prerequisite: Senior standing in an MMET program

ENGR 491 - MMET Senior Projects I
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
The first course of a three-term sequence that offers a capstone experience for students in an MMET program. This experience involves the application of knowledge and skills acquired from prior coursework to an engineered system, system optimization, project management, and material related to a group-engineering project. This course will be focused on the proposal and planning stages of the project assigned.
Prerequisites: Senior standing in an MMET program and instructor consent

ENGR 492 - MMET Senior Projects II
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
The second course of a three-term sequence that offers a capstone experience for students in an MMET program. This experience involves the application of knowledge and skills acquired from prior coursework to an engineered system, system optimization, project management, and material related to a group-engineering project. This course will be focused on the design and analysis of the project assigned.
Prerequisite: ENGR 491

ENGR 493 - MMET Senior Projects III
Lecture Hours: 1
Lab Hours: 6
Credit Hours: 3
The third course of a three-term sequence that offers a capstone experience for students in an MMET program. This experience involves the application of knowledge and skills acquired from prior coursework to an engineered system, system optimization, project management, and material related to a group-engineering project. This course will be focused on the implementation and assessment stages of the project assigned.
Prerequisite: ENGR 492

ENGR 507 - Seminar
Lecture Hours: 12
Lab Hours: 0
Credit Hours: 12
(Hours to be arranged each term.)

ENGR 511 - Res Meth & Innov: Intel Prop
Lecture Hours: 4
Lab Hours: 0
Credit Hours: 4
Intellectual property (IP) development, evaluation, and strategy, IP fundamentals, patent fundamentals, conducting patentability searches, evaluating the patentability potential of an invention, drafting invention disclosures for patent applications, assessing the value of a patent or patent portfolio, and IP licensing.

ENGR 512 - Res Meth & Innov: Res Meth
Lecture Hours: 4
Lab Hours: 0
Credit Hours: 4
Fundamental concepts of scientific research. An introduction to the concepts underlying peer-reviewed research, evaluating the relevance and impact of sources, conducting literature reviews, evaluating published findings, using research productivity tools, using statistical methods, designing research studies, and writing scholarly articles.

ENGR 513 - Res Meth & Innov: Strat & Inno
Lecture Hours: 4
Lab Hours: 0
Credit Hours: 4
Strategy and innovation concepts with a focus on technology commercialization. Business strategy frameworks, financial analysis, strategic marketing, operations management, business models, project management, business law, and entrepreneurship.

ENGR 522 - Process Control
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Design of continuous and batch process control systems. Advanced control schemes, including model-based methods.
Prerequisites: ENGR 561 and ENGR 564

ENGR 561 - Modeling and Simulation of Dynamic Systems
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Conservation laws of physics are used to develop lumped-parameter models of continuous-time dynamic systems. Modeling and analysis of engineering systems containing mechanical, electrical, electromechanical, fluid, and thermal components. Computational methods are used to simulate a range of practical engineering problems.
Prerequisite: Graduate standing in Engineering

ENGR 562 - Control Engineering II: Modern Methods
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Modeling, simulation, and control of continuous and discrete processes using state-space methods. State functions, state equations, transfer matrices. State-space model building, state-feedback control and observation, pole placement, state vector transformations. Discrete time control systems.
Prerequisites: EE 461 or an equivalent undergraduate course in control system engineering, and ENGR 561 both with grade "C" or better

ENGR 563 - Motion Control in Mechanisms and Robotics
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Motion control components, beginning with the study of the function, classification, position, velocity, and acceleration of fundamental mechanisms and robot kinematic chains. Dynamic response of open- and closed-loop mechanisms to periodic and non-periodic loading. Motion and torque control.
Prerequisites: ENGR 561 with grade "C" or better, and graduate standing in Engineering

ENGR 564 - Autonomous Systems
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
A capstone course in the Robotics, Control, and Autonomous Systems Engineering sequence. A unified treatment using dynamics, modeling, simulation, and control in the analysis synthesis of autonomous control systems.
Prerequisites: ENGR 562, ENGR 563 both with grade "C" or better, and graduate standing in Engineering

ENGR 596 - Grad Research & Development
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Selected engineering topics at the graduate level. Course may be repeated for credit.

ENGR 597 - Graduate Project
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Graduate project in engineering topics. Course may be repeated for credit.

ENGR 598 - Graduate Thesis
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Graduate thesis in engineering topics. Course may be repeated for credit.

ENGR 599 - Practicum
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Supervised practical experience in engineering topics at the graduate level. Course may be repeated for credit.

Engineering Technology

ENGT 101 - Engr Tech
Lecture Hours: 2
Lab Hours: 6
Credit Hours: 4
Engineering terminology and problem solving tools including computer aided drafting, technical sketching, word processing, spread sheets, multiview projections, significant figures, and

engineering problem solving techniques.
Prerequisite: MATH 100

ENGT 103 - Engineering Terminology
Lecture Hours: 3
Lab Hours: 2
Credit Hours: 4
Terminology, symbols, and units commonly used in the engineering field. Interpretation and reproduction techniques of engineering drawings and graphs. A brief overview of the field of civil engineering. This course is designed primarily for the Office Systems Technology program.

ENGT 104 - Elec Nomenclature/Symbols
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
A survey course in basic electricity and electronics, emphasizing terminology and nomenclature. This course is designed primarily for the Office Systems Technology program.

ENGT 107 - Seminar
Lecture Hours: 0
Lab Hours: 0
Credit Hours: 15
(Hours to be arranged each term.)

ENGT 207 - Seminar
Lecture Hours: 6
Lab Hours: 0
Credit Hours: 6
(Hours to be arranged each term.)

ENGT 307 - Seminar
Lecture Hours: 0
Lab Hours: 0
Credit Hours: 15
(Hours to be arranged each term.)

ENGT 310 - Intro to Geo Energy
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Overview of geothermal energy: distribution, geology, hydrology, and geochemistry; exploration and extraction techniques; uses including power generation, space heating, agriculture, process and multistage utilization; and environmental, economic, and legal considerations. Field trips to local sites.

ENGT 311 - Passive Solar/Cell Desgn
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Residential passive solar heating and super-insulation construction techniques including heat load calculations using the Balcomb SHF method. Technical and economic analysis of solar electric cells, storage batteries, and inverter technology.
Prerequisite: PHY 202 or instructor consent

ENGT 312 - Critical Path Techniques
Lecture Hours: 1
Lab Hours: 3
Credit Hours: 2
Scheduling techniques used by management on engineering and industrial projects. The course will concentrate on the Critical Path Method (CPM), but will also include comparisons with Gantt Charts and Program Evaluation Review Technique (PERT). Concepts will be applied to mini-projects in class and expanded through the use of selected computer software packages.

ENGT 370 - Intro to Auto/Robotics
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
A survey of automation and all areas of robotics with an emphasis on the industrial robot. It will include history, terminology, use, future, impact on society, and hands-on labs.
Prerequisites: MATH 112 and a programming course

ENGT 390 - Co-op Field Practice
Lecture Hours: 6
Lab Hours: 0
Credit Hours: 6
An approved work program related to the student's field of specialization for a continuous three-month or six-month period. The employer and the type, level, and difficulty of the particular job must be approved by the student's engineering technology department prior to the employment period. A written comprehensive report of each season's activity must be submitted during the following term of residence.
Prerequisites: Associate degree and two terms of residence

ENGT 391 - Co-op Field Practice
Lecture Hours: 6
Lab Hours: 0
Credit Hours: 6
An approved work program related to the student's field of specialization for a continuous three-month period.

ENGT 407 - Seminar
Lecture Hours: 6
Lab Hours: 0
Credit Hours: 6
Hours to be arranged with approval of curriculum coordinator.

ENGT 415 - Occupational Safety
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
Topics include current occupational safety and health issues. Practical application of regulations in the industrial setting. Compliance to Industrial Hygiene and General Safety Standards. Common safety violations and implementation of safety programs.
Prerequisite: Junior standing in MFG

ENGT 471 - Micro/Appl/Auto/Robot
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
This is an applied course in using microprocessors to support controlling motion, such as in robotic manipulators and automated equipment and interfacing sensor inputs.
Prerequisites: CST 331 and ENGT 370

ENGT 490 - Co-op Field Practice
Lecture Hours: 6
Lab Hours: 0
Credit Hours: 6
An approved work program related to the student's field of specialization for a continuous three-month or six-month period. The employer and the type, level, and difficulty of the particular job must be approved by the student's engineering technology department prior to the employment period. A written comprehensive report of each season's activity must be submitted during the following term of residence.
Prerequisites: Associate degree and two terms of residence

ENGT 491 - Co-op Field Practice
Lecture Hours: 6
Lab Hours: 0
Credit Hours: 6
An approved work program related to the student's field of specialization for a continuous three-month period.

ENGT 500 - Research Methods
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Study of industrial analytical techniques used to develop new technologies, including the use of computer aided engineering systems and software for design purposes. Examination of research and development methods, current industrial practices and applications of new technologies.

ENGT 507 - Seminar
Lecture Hours: 0
Lab Hours: 0
Credit Hours: 12
(Hours to be arranged each term.) In-depth examination of current theories, research, trends, and processes of industry. Individual study, information exchange, and research of selected industrial topics.

ENGT 518 - Data Communications
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Data communications and computer network protocols, hardware elements, and software algorithms. Error handling, routing, flow control, host-to-host communications, and local area networks.

ENGT 521 - ASIC Design I
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Techniques for designing Application Specific Integrated Circuits (ASICs). Comprehensive study of computer concepts

using computer aided design tools. Implementation of ASIC devices in digital computing systems including: modeling (using VHDL), digital synthesis, place and routing functions, and layout. Design exercises accomplished using hardware description languages and simulation.
Prerequisite: VLSI or ASIC coursework or experience

ENGT 522 - ASIC Design II
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Techniques used to transform hardware description language-based designs to physical layout. Applications of synthesis tools for floor planning and layout of Application Specific Integrated Circuits. Comprehensive study of logic design, layout generated design, and advanced CMOS circuit techniques used when designing with standard cells.
Prerequisite: ENGT 521

ENGT 523 - Advanced ASIC Design
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Introduction to very large scale integration (VLSI) technology and design of CMOS integrated circuits including: the device fabrication process and design rules as they apply to device layout. Analysis, design, simulation and layout rules presented. Logic gates and functions design.
Prerequisite: ENGT 522

ENGT 545 - Adv Microcomputers
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Microprocessor technology and its application to the design of practical digital computing systems. Design techniques used to develop and design newer generation microprocessor-based computing systems. Assembly language programming and interfacing of microprocessor-based systems.
Prerequisite: Microprocessor coursework or experience

ENGT 546 - Adv Comp Architectures
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Advanced topics in computer architectures including design of computer hardware, organizational structures, and architectural properties of parallel, vector and multi-processing systems. Computer organizational structures of memory and I/O subsystems, multiprocessor computer architectures, and data flow computers.
Prerequisite: Course work or experience in computer architecture and organization

ENGT 565 - Semicond Dev Phy/Process
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Simple models and physical insight to solid state physics. Crystal structure and symmetry, crystal lattices, reciprocal lattices, equilibrium and nonequilibrium processes in semiconductors. Thermal properties, energy band, and semiconductor properties.

ENGT 581 - Master's Project I
Lecture Hours: 1
Lab Hours: 9
Credit Hours: 4
Students prepare the proposal for the Master's project under the guidance of a project advisor. Project proposal guidelines and accepted format presented. Approval of the proposal by the student's project committee constitutes completion of the course.

ENGT 582 - Master's Project II
Lecture Hours: 1
Lab Hours: 9
Credit Hours: 4
Students complete task specified by the project advisor. Preliminary results of the student's project presented to the student's project committee. Acceptance of these results constitutes completion of the course.
Prerequisite: ENGT 581

ENGT 583 - Master's Project III
Lecture Hours: 1
Lab Hours: 9
Credit Hours: 4
Students produce the final report demonstrating the completion of the project. Final results of the student's Master's project presented to the student's project committee. Acceptance of the report by the student's project committee constitutes completion of the course.
Prerequisite: ENGT 582

Environmental Sciences

ENV 107 - Seminar
Lecture Hours: 0
Lab Hours: 0
Credit Hours: 15
(Hours to be arranged each term.)
Prerequisite: ENV major or instructor consent

ENV 108 - Mentorship & Team Building
Lecture Hours: 1
Lab Hours: 0
Credit Hours: 1
We develop a strong sense of community, trust, inclusion, and belonging within the Environmental Science program among all students and faculty. We introduce student mentorship opportunities and engage in team building exercises and environmental exploration during a weekend camping trip. Course is required every Fall. Can be taken multiple times for credit.

ENV 111 - Intro to Env Sciences
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
A topical overview of environmental sciences stressing the integration of the social, natural and physical sciences. Emphasis on active learning.

ENV 207 - Seminar
Lecture Hours: 6
Lab Hours: 6
Credit Hours: 6
(Hours to be arranged each term.)
Prerequisite: ENV major or instructor consent

ENV 214 - Watershed Sci & Tech
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
Science and technology of watershed processes, monitoring, and assessment. Applications and case studies focused on sustainable management and restoration of water resources and their associated aquatic, riparian, and upland ecosystems. Local and regional sites of interest are highlighted.
Prerequisite: ENV 111 or GEOG 105, or instructor consent

ENV 217 - Intro to Nat Res Mgmnt
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 4
An introduction to management of natural resources including water, air, forests, wildlife and fisheries, minerals and energy. Explore structured decision making, risk assessment, uncertainty, stakeholder engagement, adaptive management, conservation and scenario planning, and climate and environmental mitigation, adaptation, and resiliency.
Prerequisite: ENV 111

ENV 224 - Scientific Reason & Method
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Fundamental principles and practices of scientific reasoning and methodology, including contrasts with other ways of making knowledge, the power of questions, theories versus hypotheses, understanding experiments, supporting claims, drawing inferences, reproducibility, and coping with uncertainty in typical uncontrolled natural experiments.
Prerequisite: ENV 111 or GEOG 105, or instructor consent

ENV 226 - Environmental Data Analysis
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
Introduction to compilation, manipulation, and analysis of datasets common to environmental analysis. Includes measures of central tendency and spread; characterizing data distribution; linear regression; exceedance probability and cumulative frequency functions; understanding time series; and basic principles of graphical data displays.

Prerequisite: ENV 111 or GEOG 105, or instructor consent

ENV 265 - Field Methods Environ Science
Lecture Hours: 1
Lab Hours: 6
Credit Hours: 3
Basic principles of experimental design, site and instrument selection for field research. Basic instrumentation and data acquisition techniques are used to contribute to authentic research programs at different locations alongside environmental science professionals.

ENV 307 - Seminar
Lecture Hours: 0
Lab Hours: 0
Credit Hours: 15
(Hours to be arranged each term.)
Prerequisite: ENV major or instructor consent

ENV 314 - Env Law & Policy
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Overview of legislative, regulatory, and policy-based activities involving the development, management, and restoration of natural resources. Emphasis on the National Environmental Policy Act, Environmental Impact Statements, Endangered Species Act, and Historical Preservation through local, regional, and national case studies.
Prerequisite: ENV 111

ENV 336 - Environmental Hydrology
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Study of the hydrologic cycle; quantitative measurement of precipitation, infiltration, runoff, streamflow and storage in watersheds. Curve fitting, hydrographic analysis, statistical analysis of extreme flows, flood routing, and runoff modeling for small and urban watersheds.
Prerequisites: MATH 252 and MATH 361

ENV 355 - Careers/Professionalism in Env Sci
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Practical seminar focusing on career opportunities in environmental sciences, professional standards, culture, ethics, and skills to enhance communication and collegiality. Assists students with workforce transition, including job search, preparation of resume packages and portfolios, interviewing tips, and job-offer negotiation.
Prerequisite: ENV 111

ENV 365 - Adv Field Methods in Env Sci
Lecture Hours: 1
Lab Hours: 6
Credit Hours: 3
Basic principles of experimental design, site and instrument selection for field research. Basic instrumentation and data acquisition techniques are used to contribute to authentic research programs at different locations alongside environmental science professionals. Course may be repeated for credit.
Prerequisites: MATH 112 and WRI 122

ENV 375 - Forest Ecology & Management
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Examine abiotic and biotic factors affecting the structure, function, composition, and distribution of forest communities including wildland fire; sustainable forest management practices and policies; and core concepts required for careers in forestry, wildland fire, natural resources, range, and wildlife.
Prerequisite: BIO 211 or BIO 212 or instructor consent

ENV 407 - Seminar
Lecture Hours: 15
Lab Hours: 0
Credit Hours: 15
(Hours to be arranged each term.)
Prerequisite: ENV major or instructor consent

ENV 420 - Extern in Env Sciences
Credit Hours: Varies (1-9)
Students work in applied settings related to environmental sciences under the supervision of a mentor. Regular contact with extern advisor and mentor. Written externship report and presentation required.
Prerequisites: BIO 211, BIO 212, BIO 213, or CHE 221, CHE 222, CHE 223

ENV 427 - Greenhouse Gas Accounting/Footprints
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Course topics include US and international greenhouse gas (GHG) management policies. GHG assessment methods and tools, emissions trading programs, climate risk and risk management, data and information sources, measurement standards and protocols and related sustainability concepts and policies. Course also listed as REE 427 (cannot be used for graduation credit by students who have taken REE 427).
Prerequisites: Junior or Senior standing

ENV 434 - Advanced Data Analysis
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Overview of advanced concepts and methods of analysis specific to ecological data sets using program R. Bayesian and parametric methods, analysis of variance, linear regression, generalized linear modeling, generalized additive modeling, mixed-effect models, multi-model inference, ordination, and time-series analysis.
Prerequisites: ENV 226 and MATH 361

ENV 435 - Atmospheric Physics
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
The physics of transport and diffusion of air pollution. Atmospheric thermodynamics. Mixing heights, plume rise, and fundamentals of atmospheric turbulence. Eulerian and Lagrangian dispersion models.

ENV 465 - Ecological Resto. & Monitoring
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Principles and practices of ecological restoration, including ecosystem assessment; evaluation; and restoration, planning, design, implementation, and monitoring. Labs including fields visits and evaluation of local restoration projects.
Prerequisite: ENV 314

ENV 469 - Treatment Wetlands
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Treatment wetland features: biological, chemical, and physical properties. Planning, design, and performance assessment principles for municipal, agricultural, and storm water treatment wetlands. Considers vegetation and microbiology, aerobic and anaerobic biogeochemistry, hydraulics, and treatment efficiencies. Local case studies.
Prerequisites: CHE 202 and MATH 251

ENV 484 - Sustainable Human Ecology
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
A multidisciplinary exploration of historic, contemporary, and future interactions of human communities, economies, technologies, and ecosystems from local to global scales and the biggest problems facing long-term planetary health including climate change, energy, food and water security, health and well-being.
Prerequisite: BIO 212 or ENV 111 or instructor consent

ENV 485 - Ecoregional Management
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Provides an individual and team-based synthesis of the influence of human activities on ecoregions. Illustrates linkage between large scale climate-based ecoregions globally and their management and restoration by cooperation of land and aquatic management entitles.
Prerequisites: BIO 212 and ENV 111

ENV 495 - Research in Env. Sciences
Lecture Hours: 4
Lab Hours: 0

Credit Hours: 4
Supports student-initiated research projects in environmental sciences. Topic and scope must be reviewed and accepted by a faculty advisor. Registration by instructor consent. Counts as technical elective credit. May be repeated for up to nine total credits.

Geography

GEOG 105 - Physical Geography
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Comprehensive introduction to physical geography, including maps and representation of the earth's surface, the climate system and weather phenomena, plate tectonics, landform evolution and interpretation, and human-landscape interactions. Satisfies lab science.

GEOG 106 - Cultural Geography I
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Cultural geography of the major world developed regions other than the United States--Europe, Australia and New Zealand, the former Soviet Union, Canada and Japan. The course emphasizes the regional approach.

GEOG 107 - Cultural Geography II
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Cultural geography of the world's underdeveloped realms-the countries of Middle and South Americas and Africa. The course emphasizes the regional approach.

GEOG 108 - Cultural Geography III
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
An introduction to cultural geography of selected world realms, namely The Middle East, South Asia, East Asia, Southeast Asia, and The Pacific Realm. Cultural imprints on the physical landscape will be discussed and regional approach emphasized.

GEOG 207 - Seminar
Lecture Hours: 6
Lab Hours: 0
Credit Hours: 3
(Hours to be arranged each term.)

GEOG 305 - Geomorphology
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Principles and practices of landform analysis, focusing on processes, patters, and their interactions. Emphasis on tectonic interactions; mountains; rivers; fans and deltas; glacial and periglacial landscapes; and coastlines.
Prerequisite: GEOG 105 or GEOL 201

GEOG 307 - Seminar
Lecture Hours: 6
Lab Hours: 0
Credit Hours: 6
(Hours to be arranged each term.)

GEOG 315 - Climatology & Atmospheric Sci
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Overview and analysis of earth's climate system, focusing on radiative processes; heat distribution and budgeting; atmospheric chemistry, circulation, and precipitation; ocean-land-atmospheric interactions; and long- and short-term climate change.
Prerequisite: GEOG 105 or GEOL 201

GEOG 335 - Soils
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Processes and patterns of soil genesis and evolution, including weathering; profile development and identification; soil classification and mapping; abiotic-biotic components and interactions; and tilth, soil quality, and conservation.
Prerequisite: GEOG 105 or GEOL 201

GEOG 407 - Seminar
Lecture Hours: 12
Lab Hours: 0
Credit Hours: 12
(Hours to be arranged each term.)

Geology

GEOL 107 - Seminar
Lecture Hours: 0
Lab Hours: 0
Credit Hours: 15
(Hours to be arranged each term.)

GEOL 201 - Physical Geology
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
A brief systematic description of the major rock-forming minerals and the three major rock groups. The events of erosion, transportation, and deposition of chemically altered and physically fragmented rocks and the resulting sculpturing of the earth's surface are discussed.

GEOL 207 - Seminar
Lecture Hours: 4
Lab Hours: 0
Credit Hours: 4
(Hours to be arranged each term.)

GEOL 307 - Seminar
Lecture Hours: 0
Lab Hours: 0
Credit Hours: 15
(Hours to be arranged each term.)

GEOL 407 - Seminar
Lecture Hours: 0
Lab Hours: 0
Credit Hours: 15
(Hours to be arranged each term.)

Geographic Information Systems

GIS 103 - The Digital Earth
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
Introduction to the digital representation of the features and attributes of our natural world. Concepts, vocabulary, and use of GIS and GPS, and how these systems help solve geospatial problems. Integration of GPS data into GIS. Acquisition of GIS data via “smart phones.”

GIS 107 - Seminar
Lecture Hours: 0
Lab Hours: 0
Credit Hours: 15
(Hours to be arranged each term.)

GIS 134 - Geographic Info Systems
Lecture Hours: 1
Lab Hours: 6
Credit Hours: 3
Coordinate systems. Creating, editing, and querying feature and attribute data. Symbolizing, classifying, and labeling features. Creating and using tabular relationships. Introduction to elements of map design, Shapefile-KML and CAD-GIS data conversion. Introduction to ModelBuilder software. Use of raster data, analyzing raster surfaces. Use of web-based GIS applications and services. Extensive use of ArcGIS software.
Prerequisite: CE 203 or GIS 103
Corequisite: CE 203 or GIS 103, or instructor consent

GIS 205 - Mobile and Web GIS
Lecture Hours: 1
Lab Hours: 3
Credit Hours: 2
Theory and operation of GPS. Use of GPS and smart phones for field data collection. Creation and use of apps for data collection via smart phones. Web mapping. Real-time GIS. Creation of 3D scenes. Extensive use and creation of web-based GIS applications and services.
Prerequisite: GIS 134

GIS 207 - Seminar
Lecture Hours: 6
Lab Hours: 0
Credit Hours: 6
(Hours to be arranged each term.)

GIS 306 - Geospatial Raster Analysis
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Manipulation and storage of raster data. Measurement scales. Map algebra.

Georeferencing raster datasets. Least-cost path and corridor modeling techniques. Distance, surface and density mapping techniques. Use of local, focal, block, and zonal statistical functions. Viewshed and hydraulic analyses.
Prerequisite: GIS 134

GIS 307 - Seminar
Lecture Hours: 0
Lab Hours: 0
Credit Hours: 15
(Hours to be arranged each term.)

GIS 316 - Geospatial Vector Analysis I
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Coordinates, datums, projections. Advanced editing and annotation techniques. Use of subtypes and domains. Map and geodatabase topology. Linear referencing and dynamic segmentation. Geocoding. Working with legal descriptions. Professional map creation skills. GIS project design fundamentals. Creation and use of online GIS resources and applications.
Prerequisite: GIS 134

GIS 332 - Customizing the GIS Environ I
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Use of the Python scripting language to access, create, and manipulate geospatial data. Overview of the Python scripting language. Working with geometries. Use of cursors. Tool creation.
Prerequisites: GIS 306 or GIS 316 and CST 116 or MIS 118

GIS 407 - Seminar
Lecture Hours: 4
Lab Hours: 0
Credit Hours: 4
(Hours to be arranged each term.)

GIS 426 - Geospatial Vector Analysis II
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Advanced geospatial analysis. Extensive use and creation of relationship classes. Extensive use of subtypes, domains, validation rules, and cardinalities. Use and creation of networks for geospatial analysis. Routing. Conflation. Quantitative assessment of geographic patterns and distributions. Geostatistics.
Prerequisite: GIS 316

GIS 432 - Customizing the GIS Envirn II
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Advanced mobile GIS data collection techniques. GIS server environment. Hosting feature and geoprocessing services. Server site configuration and administration. Developing mobile and server GIS applications.
Prerequisite: GIS 332

GIS 446 - GIS Database Development
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Advanced geodatabase design. Study, use, design, and creation of data models. Design and creation of user interfaces for data entry. Capstone experience for the GIS option.
Prerequisites: GIS 426, GIS 432, and MIS 442

GIS 468 - GIS Practicum
Lecture Hours: 0
Lab Hours: 0
Credit Hours: 0
(Hours to be arranged each term.)

Geomatics

GME 107 - Seminar
Lecture Hours: 0
Lab Hours: 0
Credit Hours: 15
(Hours to be arranged each term.)

GME 161 - Plane Surveying I
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Fundamental concepts of plane surveying including theory of measurements, systematic and random errors. Distance and angle measurement using total stations and differential leveling. Calculation of bearings, azimuths, coordinates, area and traverse adjustments. Introduction to horizontal and vertical curve computations.
Corequisite: MATH 111

GME 162 - Plane Surveying II
Lecture Hours: 2
Lab Hours: 6
Credit Hours: 4
Digital theodolites and data collectors, instrument testing and observational error analysis. Theory of leveling. Solar observation and computation. E.D.M. use and calibration. Field labs including solar observations, traversing, leveling and horizontal curve layout. Introduction to COGO software.
Prerequisites: GME 161 and MATH 112

GME 163 - Route Surveying
Lecture Hours: 2
Lab Hours: 6
Credit Hours: 4
Laboratory intensive project overview including horizontal and vertical control for preliminary location and construction surveys for a secondary road. Instruction in basic elements of horizontal and vertical route alignment and layout. Determination of earthwork quantities. CAD drafting of plan, profile and cross-sections.
Prerequisites: GME 162 and GME 175, both with grade "C" or better

GME 175 - Computations and Platting
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
Coordinate geometry concepts with emphasis on solutions to standard surveying computations. Introduction to calculator and Excel spreadsheet computations. Introduction to map composition and platting using industry standard software.
Prerequisite: GME 161
Corequisite: CE 203

GME 207 - Seminar
Lecture Hours: 0
Lab Hours: 0
Credit Hours: 15
(Hours to be arranged each term.)

GME 241 - Boundary Law I
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Statute law, common law, and legal principles relating to land boundaries. Each student will be required to use the county law library to research assigned cases.
Prerequisites: GME 161 and WRI 121, or instructor consent

GME 242 - Land Descrip & Cadastre
Lecture Hours: 2
Lab Hours: 0
Credit Hours: 2
Real property descriptions and land record systems. Emphasis on interpreting and writing land descriptions, and introduction to researching records in various Land Information Systems.
Prerequisites: GME 161 and GME 241, both with grade "C" or better

GME 264 - Digital Design for Surveying
Lecture Hours: 0
Lab Hours: 6
Credit Hours: 2
Use of Carlson software to solve and plot assignments covering travers calculations, horizontal and vertical curve alignments, profiles and earthwork volumes. Hand calculations will be made to supplement the computer solutions.
Prerequisites: CE 203 and GME 163 with grade "C" or better

GME 297 - Seminar
Lecture Hours: 6
Lab Hours: 0
Credit Hours: 6
(Hours to be arranged each term.)

GME 299 - Independent Studies
Lecture Hours: 15
Lab Hours: 0
Credit Hours: 15
(Hours to be arranged each term.)

GME 307 - Seminar
Lecture Hours: 0
Lab Hours: 0
Credit Hours: 15
(Hours to be arranged each term.)

GME 324 - Geomatics Computer Programming
Lecture Hours: 1
Lab Hours: 6
Credit Hours: 3
Students develop Visual Basic programs and Excel spreadsheets to solve Geomatics problems. Extensive use of Excel spreadsheets including developing custom functions and VBA extensions. Students are introduced to MS Access relational database, and develop a functioning geomatics database.
Prerequisites: GME 264 and MIS 115

GME 343 - Boundary Surveys
Lecture Hours: 2
Lab Hours: 6
Credit Hours: 4
Planning, organizing, calculating and applying field procedures for boundary and cadastral surveys. Writing deed descriptions; researching public record systems relative to property boundaries.
Prerequisites: GME 163 and GME 242, both with grade "C" or better

GME 351 - Constr/Engr Surveying
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
Organizing, planning and estimating costs for construction and engineering surveying projects. Field projects related to construction, layout of engineering works and site mapping.
Prerequisites: GME 163 and GME 264

GME 355 - Digital Photogrammetry
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
Introduction to Photogrammetry, topics include geometry of vertical image, the stereo pair, and parallax computations. Aerotriangulation of image blocks, and project planning and mission design. Students use Softcopy workstations to compile topographic maps.
Prerequisites: GME 264 and MATH 252

GME 372 - Subdiv'n Planning and Platting
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
Land use planning; governmental regulations as applied to subdivisions; subdivision planning, computations and preparation of subdivision plots.
Prerequisites: GME 242 and GME 264, both with grade "C" or better

GME 381 - Adv Cadastral Surveying I
Lecture Hours: 2
Lab Hours: 0
Credit Hours: 2
A brief history of the United States land surveying and pertinent boundary law. Introduction to land records research. Basic boundary law principles are covered along with analysis of legal descriptions contained in deeds and other documents that transfer land title. This is a subset of the BLM CFedS material.
Prerequisites: Instructor consent, ability to perform standard surveying computations, and an understanding of boundary law

GME 395 - Cooperative Field Experience
Lecture Hours: 0
Lab Hours: 40
Credit Hours: 4
An approved work program related to geomatics practice involving full-time meaningful activity. The employer, type of work and level of difficulty must be approved by the Geomatics Co-op Coordinator prior to the work period. Progress reports are prepared by the student during the work period and submitted for review. A comprehensive written report is required at the end of each co-op period. A co-op period may be three months for 2 credits or six months for 4 credits. A tuition fee is required for credits earned by co-op work experience.
Prerequisites: Completed freshman year and two terms residence

GME 396 - Cooperative Field Practice
Lecture Hours: 0
Lab Hours: 40
Credit Hours: 2
Three month, two credit hour version of GME 395 and GME 495.

GME 407 - Seminar
Lecture Hours: 12
Lab Hours: 12
Credit Hours: 12
(Hours to be arranged each term.)

GME 415 - Advanced Road Design
Lecture Hours: 2
Lab Hours: 6
Credit Hours: 4
Complete road design project including 'L' and 'P' line locations; horizontal and vertical curve calculations with consideration of stopping and sight distances; earthwork and mass diagram calculations; drainage and road construction materials.
Prerequisite: GME 351

GME 425 - Remote Sensing
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Topics in remote sensing and photogrammetry including an introduction to classic digital image processing techniques. Digital surface modeling using terrestrial and aerial LiDAR, and semi-global matching image processing. Students use softcopy image processing software.
Prerequisites: MATH 252 and PHY 222

GME 434 - Land Admin for Sust Land Dev
Lecture Hours: 2
Lab Hours: 6
Credit Hours: 4
Review and compare land tenure systems in the United States and Foreign countries. Introduction to principles of land administration. Use of geospatial data models for management of parcel data and use of ArcGIS software for creation of Land Information Systems designed to manage cadastral data.
Prerequisites: GIS 134 and GIS 316
Corequisite: GME 452

GME 444 - Adjustment by Least Squares
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Theory of the least squares method and error propagation; variances and co-variances of observed, derived and adjusted quantities. Modeling of geomatics problems using different techniques of least squares. Linearization and iteration of nonlinear equations. Adjustment validation using hypothesis testing.
Prerequisites: MATH 254 and MATH 361

GME 451 - Geodesy
Lecture Hours: 4
Lab Hours: 0
Credit Hours: 4
Size and shape of the earth. Geometry of the reference ellipsoid. Spherical, ellipsoidal and local coordinate systems. Coordinate transformations in 2-D and 3-D. Datums and datum conversion. Reduction of field observations to the ellipsoid. The geoid, orthometric heights, and leveling.
Prerequisite: MATH 254 or instructor consent

GME 452 - Map Projections
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
Overview of map projections used in cartography, and conformal map projections used in the geomatics profession. Emphasis on state plane coordinate systems and local map projections. Extensive use of Excel for analysis and computations.
Prerequisite: GME 451 with grade "C" or better

GME 454 - GNSS Surveying
Lecture Hours: 2
Lab Hours: 6
Credit Hours: 4
Study of the theory and operation of the Global Positioning System and other Global Navigation Satellite Systems. Design of GPS networks in accordance with current standards and specifications. Laboratory exercises introduce the student to a variety of GNSS applications.
Prerequisites: GME 444 and GME 451, both with grade "C" or better

GME 455 - GNSS Surveying for GIS
Lecture Hours: 2
Lab Hours: 6
Credit Hours: 4
Study of the theory and operation of the Global Positioning System and other Global Navigation Satellite Systems. Design of

GPS networks in accordance with current standards and specifications. Laboratory exercises introduce the student to a variety of GNSS applications.
Prerequisite: GME 451 with grade "C" or better

GME 466 - Boundary Law II
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Evidence, professional liability, written and unwritten transfers of land ownership and title interests. A term paper is required of each student.
Prerequisite: GME 343 with grade "C" or better

GME 468 - Geomatics Practicum
Lecture Hours: 1
Lab Hours: 3
Credit Hours: 2
Students design and complete a Geomatics project. Students demonstrate ability to work independently. Projects are under the supervision of faculty members and comply with any related state statutes and local ordinances.
Prerequisites: GME 452, and GME 454 or GME 455

GME 482 - Adv Cadastral Surveying II
Lecture Hours: 2
Lab Hours: 0
Credit Hours: 2
Introduction to the complex task of evaluating field evidence, and correlating it with written records. Many scenarios are presented that discuss various aspects of evidence analysis. Practical advice is discussed at length along with legal concepts and issues involved in evaluating corner evidence. This is a subset of the BLM CFedS material.
Prerequisite: GME 381 with grade "C" or better

GME 483 - Adv Cadastral Surveying III
Lecture Hours: 2
Lab Hours: 0
Credit Hours: 2
Introduction to water boundaries to create awareness of basic riparian issues. Subdivision of sections addresses normal subdivision lotted closing sections, elongated and fractional sections, and the three-mile method of section subdivision. This is a subset of the BLM CFedS material.
Prerequisite: GME 482 with grade "C" or better

GME 495 - Cooperative Field Experience
Lecture Hours: 0
Lab Hours: 40
Credit Hours: 4
An approved work program related to the geomatics practice involving full-time meaningful activity. The employer, type of work and level of difficulty must be approved by the Geomatics Co-Op Coordinator prior to the work period and submitted for review. A comprehensive written report is required at the end of each co-op period. A co-op period may be three months for 2 credits or six months for 4 credits. A tuition fee is required for credits earned by co-op work experience.
Prerequisites: Completed freshman year and two terms residence

GME 496 - Cooperative Field Practice
Lecture Hours: 0
Lab Hours: 40
Credit Hours: 2
Three month, two credit hour version of GME 395 and GME 495.

GME 497 - CFedS
Lecture Hours: 4
Lab Hours: 0
Credit Hours: 4
Provides academic credit for licensed professional land surveyors who successfully completed the rigorous BLM Certified Federal Surveyor (CFedS) examination.
Prerequisite: Successful completion of the CFedS examination

GME 498 - Workshop
Lecture Hours: 15
Lab Hours: 0
Credit Hours: 15
(Hours to be arranged each term.)

GME 499 - Independent Study
Lecture Hours: 6
Lab Hours: 0
Credit Hours: 4
(Hours to be arranged each term.)

Health Education

HED 107 - Seminar
Lecture Hours: 0
Lab Hours: 0
Credit Hours: 15
(Hours to be arranged each term.)

HED 207 - Seminar
Lecture Hours: 0
Lab Hours: 0
Credit Hours: 12
(Hours to be arranged each term.)

HED 240 - Emergency Care and CPR
Lecture Hours: 2
Lab Hours: 0
Credit Hours: 2
Comprehensive coverage of emergency care for a wide variety of injuries or illnesses. Course content includes artificial respiration and cardiopulmonary resuscitation, wounds, and bleeding; shock; burns; poisonings; bone, joint, and muscle injuries; cold and heat-related injuries; alcohol and drug emergencies; and methods of transportation. Emphasis on victim examination, evaluation, and assessment tools and appropriate immediate and temporary care.

HED 246 - Drgs/Alch Prb/Mdrn Soc
Lecture Hours: 2
Lab Hours: 0
Credit Hours: 2
Physiological and psychological effects of drugs, from caffeine to heroin. A brief study of neurophysiology and pharmacology. Investigation of the major drug classifications. Other topics include alcohol advertising, co-dependency, drug-affected babies, treatment and recovery, and legalization issues.

HED 250 - Contemp Health Issues
Lecture Hours: 2
Lab Hours: 0
Credit Hours: 2
Topics related to the maintenance of a healthy lifestyle. Emphasis on lifestyle choices and behavior patterns that affect one's state of wellness. Topics include stress management; emotional, social, and spiritual well-being; nutrition, fitness and exercise; weight management; cardiovascular disease and cancer risk reduction; addictions; and other lifestyle-related health behaviors.

HED 260 - Diet/Exer Life Fitness
Lecture Hours: 2
Lab Hours: 0
Credit Hours: 2
Practical concepts of nutrition and exercise, their role in disease risk, obesity, and weight control. Consumer concerns, advertising, fads, gimmicks. Fitness and dietary evaluations.

HED 275 - Intro to Sports Medicine
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
An introduction to the principles and practice of sports medicine. Emphasis on the prevention and treatment of common sports injuries. Instruction includes understanding the basic mechanisms behind injury and practical experience in preventative measures and basic treatment.

HED 307 - Seminar
Lecture Hours: 0
Lab Hours: 0
Credit Hours: 15
(Hours to be arranged each term.)

HED 407 - Seminar
Lecture Hours: 0
Lab Hours: 0
Credit Hours: 12
(Hours to be arranged each term.)

History

HIST 101 - Hist-Western Civil
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Development of Western civilization from early beginning to present, with attention to political, economic, religious, social, and cultural factors. Courses need not be taken in sequence. HIST 101: From the origins of human civilization to 1000 A.D. HIST 102:

From 1000 A.D. to 1789. HIST 103: From 1789 to the present.

HIST 102 - Hist-Western Civil
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Development of Western civilization from early beginning to present, with attention to political, economic, religious, social, and cultural factors. Courses need not be taken in sequence. HIST 101: From the origins of human civilization to 1000 A.D. HIST 102: From 1000 A.D. to 1789. HIST 103: From 1789 to the present.

HIST 103 - Hist-Western Civil
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Development of Western civilization from early beginning to present, with attention to political, economic, religious, social, and cultural factors. Courses need not be taken in sequence. HIST 101: From the origins of human civilization to 1000 A.D. HIST 102: From 1000 A.D. to 1789. HIST 103: From 1789 to the present.

HIST 107 - Seminar
Lecture Hours: 0
Lab Hours: 0
Credit Hours: 15
(Hours to be arranged each term.)

HIST 201 - US History
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
The historical development of the United States, its economic, political, and social institutions from the colonial period to the present. Courses need not be taken in sequence. HIST 201: Pre-Columbian and colonial times to 1840. HIST 202: 1840, Westward expansion and the Civil War to 1899. HIST 203: 1900 to present.

HIST 202 - US History
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
The historical development of the United States, its economic, political, and social institutions from the colonial period to the present. Courses need not be taken in sequence. HIST 201: Pre-Columbian and colonial times to 1840. HIST 202: 1840, Westward expansion and the Civil War to 1899. HIST 203: 1900 to present.

HIST 203 - US History
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
The historical development of the United States, its economic, political, and social institutions from the colonial period to the present. Courses need not be taken in sequence. HIST 201: Pre-Columbian and colonial times to 1840. HIST 202: 1840, Westward expansion and the Civil War to 1899. HIST 203: 1900 to present.

HIST 207 - Seminar
Lecture Hours: 6
Lab Hours: 0
Credit Hours: 6
(Hours to be arranged each term.)

HIST 224 - Tech & Ancient World
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
The interaction of technology and world civilization from earliest times to 1500 A.D. Topics include the development of agriculture, urbanization, the place of technology in the Roman and Chinese empires, Medieval engineering, and the technological roots of globalization.

HIST 225 - Tech & Rise of the West
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
The economic and social roots of Western dominance of the world economy after 1500. Topics include the Trans-Atlantic Exchange, the Industrial Revolution, urbanization, globalization, and the technological roots of colonialism.

HIST 226 - Tech & Modern World
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
The interaction of technological change and world civilization in the 20th century. Topics include the role of corporations in technological change, the theory of Large Technological Systems (LTS), Cold War science and technology, and origins of the internet.

HIST 245 - Hitler & the Holocaust
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Introduction to the history of the Holocaust, with a focus on the role of Adolph Hitler. Topics include Hitler's life and political career, the social, technological and economic structure of the Holocaust, and Hitler and the Holocaust in popular culture.

HIST 275 - Intro to Hist of Medicine
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Introduction to the history of medicine, with a focus on American medicine in the 19th and 20th centuries. Topics include medical professionalization, the social, technological and economic structure of the medical industry, and medicine in popular culture.

HIST 307 - Seminar
Lecture Hours: 6
Lab Hours: 0
Credit Hours: 6
(Hours to be arranged each term.)

HIST 335 - Engineering Profession
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
The emergence and development of the engineering profession in Europe and North America. Topics include the changing nature of the profession's work and institutions, the role of engineering professional societies, the relationship between engineers, engineering technologists, and engineering technicians, and the place of engineers in society.
Prerequisite: WRI 123 or WRI 227

HIST 356 - A History of Energy
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Study of emphasis societies place on the development, safeguarding and exploitation of energy resources. Development of energy resources since the Industrial Revolution; exploitation of energy resources; oil shocks of the 1970's, glut of the 1980s; the modern energy paradigm.
Prerequisite: WRI 123 or WRI 227

HIST 357 - History of the Electric Grid
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Study of the electric grid as a large technological system. Topics of study include the creation of the electric grid by Edison and others, rural electrification, the rise and fall of the utility consensus, and the politics of deregulation.
Prerequisite: WRI 123 or WRI 227

HIST 392 - Modern Asia
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
China, Japan, and Korea from the early nineteenth century to the present. Emphasis on modern political movements and economic and cultural transformation.
Prerequisite: WRI 123 or WRI 227

HIST 407 - Seminar
Lecture Hours: 12
Lab Hours: 1
Credit Hours: 12
(Hours to be arranged each term.)

HIST 452 - Globalization & Pac NW
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
This seminar addresses globalization in the PNW. Topics include colonialism, mercantilism, markets, imperialism, and cultural exchange. PNW industries involved in globalization such as timber, fishing, agriculture, tourism, and oil will be examined. Social movements and protests will also be considered.
Prerequisite: WRI 122

HIST 468 - History of the Pacific NW
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
This course will cover the history of the Pacific Northwest including Native American settlements, exploration and later American settlements. It will include the impacts of institutional growth, urbanization, and resource development. The impact of national events upon the region will be explored.
Prerequisite: WRI 122

HIST 478 - History of Oregon
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
An overview of the history of Oregon. The primary focus is the pattern of European settlement of Oregon, the origins and development of state government and the impact of commercial and industrial development.
Prerequisite: WRI 123 or WRI 227

Health Sciences

HSC 207 - Seminar
Lecture Hours: 0
Lab Hours: 0
Credit Hours: 12
(Hours to be arranged each term.)
Prerequisite: Health Sciences major or instructor consent

HSC 407 - Seminar
Lecture Hours: 0
Lab Hours: 0
Credit Hours: 12
(Hours to be arranged each term.)

HSC 485 - Resrch/Proj Proposal
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
General aspects of conducting research with emphasis on biomedical approaches, constructing and testing hypotheses, interpreting and validating data, assessment of selected research paper, development and submission of a research proposal to be implemented in HSC 499.
Prerequisites: MATH 361, Health Sciences major, or instructor consent

Humanities

HUM 105 - EAC: Text, Images, Games
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Introduction to the methods of literary analysis and cultural studies. How to effectively and thoroughly analyze, discuss and criticize the meanings behind literature, visual art, film, the graphic novel, and video games from the perspective of literary studies.

HUM 107 - Seminar
Lecture Hours: 0
Lab Hours: 0
Credit Hours: 15
(Hours to be arranged each term.)

HUM 125 - Intro Tech, Soc, Value
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
An introduction to the relationship of economic, political and social contexts to technological development with a focus on human values.

HUM 147 - West Cult in the Classical Age
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Study of the ideas and values from the classical period which have profoundly influenced Western culture. Readings and discussion will focus on arts, literature, and philosophy.

HUM 148 - West Cult in the Medieval Age
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Study of the ideas and values from the early Medieval to the Renaissance period which have profoundly influenced Western culture. Readings and discussion will focus on arts, literature, and philosophy.

HUM 149 - West Cult in the Modern Age
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Study of the ideas and values from the Age of Enlightenment to today which have profoundly influenced Western culture. Readings and discussion will focus on arts, literature, and philosophy.

HUM 207 - Seminar
Lecture Hours: 12
Lab Hours: 0
Credit Hours: 12
(Hours to be arranged each term.)

HUM 225 - Cont Thter: Ashland Plays
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Contemporary live drama viewed at Ashland Shakespearean Festival Theater. Review and analysis of original script prior to play experience. Post review and analysis of play performance, content: plot, character, diction, melody, spectacle.

HUM 235 - Introduction to Film
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Introduction to film history and appreciation. Students will engage with film across periods, genres, and national traditions to develop their understanding and analysis of the art of cinema. Film making techniques and the evolution of film culture are addressed.

HUM 307 - Seminar
Lecture Hours: 6
Lab Hours: 0
Credit Hours: 6
(Hours to be arranged each term.)

HUM 335 - Video Game Studies
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Students will read essays and criticism about video games, including traditional console and PC games, 'serious games,' and social-media-powered games. If possible, some assignments will also involve playing the games we discuss.
Prerequisite: WRI 122

HUM 345 - Digital Culture and Society
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
In this class, students will study and analyze internet culture through a humanistic lens. Topics discussed may include online identity construction, social media's effects on relationships, the digital divide, the internet's influence on politics, and online representation for marginalized groups.
Prerequisite: WRI 122

HUM 407 - Seminar
Lecture Hours: 6
Lab Hours: 0
Credit Hours: 6
(Hours to be arranged each term.)

Journalism

JOUR 107 - Seminar
Lecture Hours: 0
Lab Hours: 0
Credit Hours: 15
(Hours to be arranged each term.)

JOUR 207 - Seminar
Lecture Hours: 6
Lab Hours: 0
Credit Hours: 6
(Hours to be arranged each term.)

JOUR 211 - Pub/Student Newspaper
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
Practical experience and training in the elementary principles of newspaper writing, makeup, and layout. Members of this class will publish the student newspaper.
Prerequisite: WRI 121

JOUR 307 - Seminar
Lecture Hours: 0
Lab Hours: 0
Credit Hours: 15
(Hours to be arranged each term.)

JOUR 311 - Adv Pub/Student News
Lecture Hours: 1
Lab Hours: 3
Credit Hours: 3
Provides advanced experience and training in principles of newspaper editing, reporting, writing, makeup, layout, and specialty areas. Class members serve as the editorial staff.
Prerequisite: JOUR 211

JOUR 407 - Seminar
Lecture Hours: 6
Lab Hours: 0
Credit Hours: 6
(Hours to be arranged each term.)

Literature

LIT 104 - Intro to Literature
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Literature and the nature of literary experience through reading prose and poetry drawn from American and other Literatures. Works representing principle literary types are read in their entirety when possible, with emphasis on such elements as structure, style, characterization, imagery, and symbolism.

LIT 105 - Intro to Literature
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Literature and the nature of literary experience through reading prose and poetry drawn from American and other Literatures. Works representing principle literary types are read in their entirety when possible, with emphasis on such elements as structure, style, characterization, imagery, and symbolism.

LIT 106 - Intro to Literature
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Literature and the nature of literary experience through reading prose and poetry drawn from American and other Literatures. Works representing principle literary types are read in their entirety when possible, with emphasis on such elements as structure, style, characterization, imagery, and symbolism.

LIT 107 - Seminar
Lecture Hours: 6
Lab Hours: 0
Credit Hours: 6
(Hours to be arranged each term.)

LIT 207 - Seminar
Lecture Hours: 6
Lab Hours: 0
Credit Hours: 6
(Hours to be arranged each term.)

LIT 235 - American Multicultural Lit
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
An introductory study of short stories, poetry, essays, and a novel that illustrates the diversity of North American culture.

LIT 253 - 19th Century American Lit
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Survey of American Literature from 1800-1900. Genres include short stories, novels, poetry, nonfiction narratives, and drama. Topics include Romanticism, Gothic literature, Transcendentalism, Colonialism, Emancipation, and Women's Rights.
Prerequisite: WRI 121

LIT 254 - 20th Century American Lit
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Survey of American Literature from 1900-1970. Genres include short stories, novels, poetry, nonfiction narratives, and drama. Topics include Urban Gothic literature, Modernism, World Wars 1 and 2, and Environmentalism.
Prerequisite: WRI 121

LIT 255 - Contemporary American Lit
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Survey of American Literature from 1970-present. Genres include short stories, novels, poetry, nonfiction narratives graphic novels, and drama. Topics include Postmodernism, the Cold War, Cyberpunk Literature, Postapocalyptic Literature, and Environmentalism.
Prerequisite: WRI 121

LIT 266 - Native American Lit & Film
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Explores connections to the human condition found in literature and stories authored by Native Americans with focus on a variety of themes including assimilation, ethnicity, survival and stereotyping. Documentary films and commercial cinema support and lend context to the readings. Students are encouraged to define and/or redefine their worldviews.

LIT 305 - Ecol Issues in Nature Writing
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Students will study how our perception of the environment has changed over the last two hundred years of Western culture. We will analyze the works of well-known nature writers as well as other related texts from a literary studies perspective.
Prerequisite: WRI 122

LIT 307 - Seminar
Lecture Hours: 6
Lab Hours: 0
Credit Hours: 6
(Hours to be arranged each term.)

LIT 315 - Science Fiction Lit & Film
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Study of science fiction literature and film as expressions of the relationship between technology and culture(s). Approach will primarily be from a literary analysis perspective, with elements of film studies included.
Prerequisite: WRI 122

LIT 325 - The Metropolis
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Study of the history of the modern city in Western culture from a cultural studies perspective. Students discuss works of literature, film, and new media dealing with our understanding of urban space over time.
Prerequisite: WRI 122

LIT 335 - Travel Lit: Fiction & Nonfict
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Study of travel narratives in Western Culture from the British Empire to today. Focus will be on narratives' depictions of wilderness vs. civilization and traveling as a transformative experience.
Prerequisite: WRI 122

LIT 345 - Postapocalyptic Lit & Film
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Inquiry into the recent popularity of Postapocalyptic-themed literature and films. Study of Postapocalyptic subgenres including natural disasters, rogue artificial intelligence, zombies, etc. and the historiocultural context from which they each have emerged.
Prerequisite: WRI 122

LIT 346 - Creative Writing
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Examines the elements, structures and traditions of fiction writing through readings, discussions, and creative writing exercises. For students interested in writing fiction.
Prerequisite: WRI 122

LIT 367 - Art & Trash in Contemp Fiction
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
In-depth study of contemporary fiction, finding meaning in literature responsive to the human condition and relevant to the

reader. Includes works from authors such as Margaret Atwood, Tim O'Brien, Alice Munro and Anthony Doerr.
Prerequisite: WRI 122

LIT 373 - British Culture & Literature
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Explores features of culture and selected works and writers from the Nineteenth and Twentieth Centuries in Britain. Some film presentation included.

LIT 381 - Contemporary World Lit
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
An in-depth study of selected writers and works organized thematically, geographically, and ethnically. The focus on contemporary works provides insight into current world cultures and explores globalization while encouraging students to critically examine their worldviews.
Prerequisite: WRI 122

LIT 407 - Seminar
Lecture Hours: 6
Lab Hours: 0
Credit Hours: 6
(Hours to be arranged each term.)

LIT 456 - Topics in Film
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Examines films as stories using modern literary criticism techniques. Offerings include close analysis of contemporary film, selected directors, selected genres and surveys of film history.
Prerequisites: 3 credits of English or Humanities and WRI 121

Mathematics

MATH 20 - Basic Mathematics
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Operations with whole numbers, fractions and decimals. Ratio, proportion, and percent, with applications. Calculations using length, area, and volume. Estimation and unit conversion. Credits earned apply for enrollment (eligibility), but not apply toward a degree. An additional fee is required above regular tuition.
Note: Unless otherwise indicated with F, W, S courses will be offered as often as requested.

MATH 70 - Elementary Algebra
Lecture Hours: 4
Lab Hours: 0
Credit Hours: 4
For students whose preparation contains no algebra background or whose placement examination scores do not qualify for entry into Intermediate Algebra. The topics covered stress the fundamental properties of algebra, solving equations, and manipulating algebraic fractions. Credits earned apply for enrollment (eligibility) but do not apply toward a degree. An additional fee is required above regular tuition.
Note: Unless otherwise indicated with F, W, S courses will be offered as often as requested.
Prerequisite: MATH 20 with grade "C" or better, or equivalent

MATH 97 - Algebra Review
Lecture Hours: 2
Lab Hours: 0
Credit Hours: 2
Structured review for students whose Math Placement score may not reflect an accurate evaluation or students who want a refresher but who do not require a math placement. The course has individualized directed study using a comprehensive programmed instructional technology.
Course is graded P/NP.
Note: Unless otherwise indicated with F, W, S courses will be offered as often as requested.

MATH 100 - Intermediate Algebra
Lecture Hours: 4
Lab Hours: 0
Credit Hours: 4
Fundamentals of algebra, linear and quadratic equations, systems of equations, inequalities, functions and graphs, radicals and exponents, and stated problems. (May not be used for graduation credit.)
Prerequisite: MATH 70 with grade "C" or better, or equivalent

MATH 101 - Accelerated Algebra
Lecture Hours: 4
Lab Hours: 0
Credit Hours: 4
An accelerated algebra course with topics ranging from Elementary Algebra (MATH 70) to College Algebra (MATH 111). For entering students with good high-school algebra backgrounds. All students will start in Elementary Algebra, and may receive credit for one of MATH 70, MATH 100, or MATH 111, depending on individual level of achievement. An additional self-support course fee is required.

MATH 105 - Collegiate Mathematics
Lecture Hours: 4
Lab Hours: 0
Credit Hours: 4
A variety of modern mathematical topics based on contemporary applications. Topics include combinatorics, probability, statistics, finance, matrices, and logarithmic and exponential functions.

MATH 107 - Seminar
Lecture Hours: 0
Lab Hours: 0
Credit Hours: 15
(Hours to be arranged each term.)

MATH 111 - College Algebra
Lecture Hours: 4
Lab Hours: 0
Credit Hours: 4
Study of functions including graphs, operations and inverses. Includes polynomial, rational, exponential, logarithmic functions and their applications, and systems of equations.
Prerequisite: MATH 100 with grade "C" or better, or equivalent

MATH 111A - College Algebra
Lecture Hours: 1
Lab Hours: 2
Credit Hours: 2
For students requiring MATH 111 but desiring to learn the material at a slower pace. MATH 111 content covered upon completion of MATH 111A and MATH 111B.
Prerequisite: MATH 100 with grade "C" or better, or equivalent

MATH 111B - College Algebra
Lecture Hours: 1
Lab Hours: 2
Credit Hours: 2
For students requiring MATH 111 but desiring to learn the material at a slower pace. MATH 111 content covered upon completion of MATH 111A and MATH 111B.
Prerequisite: MATH 111A with grade "C" or better

MATH 112 - Trigonometry
Lecture Hours: 4
Lab Hours: 0
Credit Hours: 4
The trigonometric functions and their applications. Topics include graphs, identities, trigonometric equations, vectors and complex numbers.
Prerequisite: MATH 111 with grade "C" or better, or equivalent

MATH 207 - Seminar
Lecture Hours: 6
Lab Hours: 0
Credit Hours: 6
(Hours to be arranged each term.)

MATH 211 - Fundamentals of Elem Math I
Lecture Hours: 4
Lab Hours: 0
Credit Hours: 4
This is the first course in the mathematics sequence for prospective teachers. Topics include problem solving strategies, set theory, numeration, computational algorithms for whole numbers and integers, estimation, relations; use is made of calculators and manipulatives.
Prerequisite: MATH 100 or equivalent with grade "C" or better

MATH 212 - Fundamentals of Elem Math II
Lecture Hours: 4
Lab Hours: 0

Credit Hours: 4
This is the second course in the mathematics sequence for prospective elementary teachers. Topics include decimals, percents, ratios and proportions, real numbers, probability, and statistics; use is made of calculators and manipulatives.
Prerequisite: MATH 211 with grade "C" or better

MATH 213 - Fundamentals of Elem Math III
Lecture Hours: 4
Lab Hours: 0
Credit Hours: 4
This is the third course in the mathematics sequence for prospective elementary teachers and covers basic geometry. Topics include geometric shapes and their properties, measurement, congruence and similarity, and coordinate and transformational geometry; use is made of calculators and manipulatives.
Prerequisite: MATH 211 with grade "C" or better

MATH 221 - Intro to Computational Sftware
Lecture Hours: 2
Lab Hours: 0
Credit Hours: 2
Solve applied problems involving formulas, functions, summations and iteration using Excel and MATLAB. Use built-in functions and graphing capabilities of MATLAB and Excel. Do vector and matrix calculations and write files using MATLAB. Write and execute macros in Excel.
Prerequisite: MATH 112

MATH 243 - Introductory Statistics
Lecture Hours: 4
Lab Hours: 0
Credit Hours: 4
Descriptive statistics, numerical and graphical presentation of data, estimation and margin of error, hypothesis testing, correlation, interpretation of statistical results. Can not be taken for graduation credit by students who have taken MATH 361.
Prerequisite: MATH 100 or instructor consent

MATH 251 - Differential Calculus
Lecture Hours: 4
Lab Hours: 0
Credit Hours: 4
Theory, computational techniques and applications of the derivative.
Prerequisite: MATH 112 with grade "C" or better, or equivalent

MATH 252 - Integral Calculus
Lecture Hours: 4
Lab Hours: 0
Credit Hours: 4
Computational techniques for and applications of the definite and indefinite integrals.
Prerequisite: MATH 251 with grade "C" or better

MATH 253 - Sequences and Series
Lecture Hours: 4
Lab Hours: 0
Credit Hours: 4
Indeterminate forms and improper integrals. Infinite sequences and series, convergence, power series. Taylor series and applications.
Note: Unless otherwise indicated with F, W, S courses will be offered as often as requested.
Prerequisite: MATH 252 with grade "C" or better

MATH 254 - Vector Calculus I
Lecture Hours: 4
Lab Hours: 0
Credit Hours: 4
Vectors, vector functions, and curves in two and three dimensions. Surfaces, partial derivatives, gradients, and directional derivatives. Multiple integrals using rectangular and other coordinate systems. Physical and geometric applications.
Note: Unless otherwise indicated with F, W, S courses will be offered as often as requested.
Prerequisite: MATH 252 with grade "C" or better

MATH 261 - Introduction to Linear Algebra
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Matrices and matrix operations, systems of linear equations, vectors in a geometric setting, projections, dot products, cross products, inverse matrices, determinants, linear transformations. Eigenvalues, Eigenvectors. Use of MATLAB or equivalent CAS and/or a graphing calculator required.
Pre-or Corequisite: MATH 251 or instructor consent

MATH 307 - Seminar
Lecture Hours: 6
Lab Hours: 0
Credit Hours: 6
(Hours to be arranged each term.)

MATH 310 - Mathematical Structures
Lecture Hours: 4
Lab Hours: 0
Credit Hours: 4
Introduction to proof and mathematical abstraction. Topics include logical statements, sets, set operations, functions, and relations.
Prerequisite: MATH 252 with grade "C" or better

MATH 311 - Introduction to Real Analysis
Lecture Hours: 4
Lab Hours: 0
Credit Hours: 4
A one quarter stand-alone course on topics in real analysis, covering properties of real numbers, completeness axiom, continuity, convergence of sequences and series of real numbers, convergence of sequences and series of functions. Emphasis will be placed on proofs.
Prerequisites: MATH 310 with grade "C" or better

MATH 315 - History of Mathematics
Lecture Hours: 4
Lab Hours: 0
Credit Hours: 4
This course will explore major themes in mathematics and their development throughout history from cultures around the world. The course will address different perspectives on mathematics and how it influenced the growth of the field and the cultures it was developed in.
Prerequisites: MATH 252 with grade "C" or better, SPE 111, and WRI 122

MATH 321 - Appl Diff Equation I
Lecture Hours: 4
Lab Hours: 0
Credit Hours: 4
The first in a two term sequence on the solutions of ordinary differential equations. Introduction to differential equations, first and second order equations with applications.
Prerequisite: MATH 252 with grade "C" or better

MATH 322 - Appl Diff Equation II
Lecture Hours: 4
Lab Hours: 0
Credit Hours: 4
The second in a two quarter sequence on the solutions of ordinary differential equations. Introduction to systems of equations, the Laplace transform and series solutions.
Prerequisites: MATH 321 and MATH 341

MATH 327 - Discrete Mathematics
Lecture Hours: 4
Lab Hours: 0
Credit Hours: 4
Introduction to proof and mathematical abstraction. Topics include sets, set operations, functions, relations, sequences, series, recurrence relations, mathematical induction, equivalence relations.
Prerequisites: MATH 111 and MATH 252, both with grade "C" or better, or Junior standing

MATH 341 - Linear Algebra I
Lecture Hours: 4
Lab Hours: 0
Credit Hours: 4
The study of vectors and matrices in Euclidean space, their geometric interpretations and application to systems of equations. Includes linear independence of vectors, basis and dimension, introduction to linear transformations, eigenvalues and eigenvectors, diagonalization, determinants.
Prerequisite: MATH 252 with grade "C" or better

MATH 342 - Linear Algebra II
Lecture Hours: 4
Lab Hours: 0
Credit Hours: 4

A continuation of the topics of MATH 341 to the setting of abstract vector spaces. Includes the study of orthogonality, inner spaces, eigenvalues and eigenvectors, matrix decompositions and a more advanced study of linear transformations.
Prerequisite: MATH 341

MATH 346 - Number Theory
Lecture Hours: 4
Lab Hours: 0
Credit Hours: 4
A proof-based course in the theory of integers, including divisibility, primes, Euclid's Algorithm, Euler's Theorem, and an introduction to algebraic structures. The course also includes applications of number theory such as RSA encryption.
Prerequisite: MATH 327 with grade "C" or better

MATH 347 - Fundmtls of Abstract Algebra
Lecture Hours: 4
Lab Hours: 0
Credit Hours: 4
Introduction to group theory and algebraic structures with applications.
Prerequisites: MATH 254 and MATH 327, both with grade "C" or better

MATH 354 - Vector Calculus II
Lecture Hours: 4
Lab Hours: 0
Credit Hours: 4
Review of vector functions, space curves, gradients, and directional derivatives. Introduction to vector analysis: vector fields, divergence, curl, line integrals, surface integrals, conservation fields, and the theorems of Gauss, Green and Stokes with application to force, work, mass and charge.
Prerequisite: MATH 254 with grade "C" or better

MATH 361 - Statistical Methods I
Lecture Hours: 4
Lab Hours: 0
Credit Hours: 4
Descriptive statistics, experimental design, introduction to probability, common probability distributions, random variables, sampling distributions, hypothesis testing and confidence intervals for means using one or two samples, simple linear regression.
Prerequisite: MATH 111 or instructor consent

MATH 362 - Statistical Methods II
Lecture Hours: 4
Lab Hours: 0
Credit Hours: 4
Review of inferential statistics, analysis of variance one factor and two factor, simple and multiple regression, analysis of categorical data using tests and confidence intervals for proportions and chi-square tests, correlation, goodness of fit, non-parametric tests. Data sets used will come from various fields including: business, psychology, biology, environmental science, engineering, manufacturing and communication.
Prerequisite: MATH 361 or instructor consent

MATH 371 - Finite Math/Calc I
Lecture Hours: 4
Lab Hours: 0
Credit Hours: 4
Linear functions, matrices, linear programming, mathematics of finance, derivatives and their applications. The integral and its applications, and calculus of several variables. (MATH 371 cannot be used for graduation credit by students who have taken MATH 251).
Prerequisite: MATH 111 with grade "C" or better

MATH 372 - Finite Math/Calc II
Lecture Hours: 4
Lab Hours: 0
Credit Hours: 4
Linear functions, matrices, linear programming, mathematics of finance, derivatives and their applications. The integral and its applications and calculus of several variables. (MATH 371 cannot be used for graduation credit by students who have taken MATH 251).
Prerequisite: MATH 371 with grade "C" or better

MATH 407 - Seminar
Lecture Hours: 6
Lab Hours: 0
Credit Hours: 6
(Hours to be arranged each term.)

MATH 411 - Topics in Complex Analysis
Lecture Hours: 4
Lab Hours: 0
Credit Hours: 4
Complex numbers and functions, differentiation and integration, Cauchy's theorem and integral formula, Taylor and Laurent series, Residue theorem.
Prerequisite: MATH 254

MATH 421 - Applied Partial Diff Equations
Lecture Hours: 4
Lab Hours: 0
Credit Hours: 4
The first course in a three quarter sequence in applied partial differential equations. Modeling physical systems using differential equations, classifying differential equations and introduction to the methods of solving partial differential equations (separation of variables, Fourier series, transform methods).
Prerequisites: MATH 321 and MATH 254

MATH 422 - Applied Partial Diff Equtns II
Lecture Hours: 4
Lab Hours: 0
Credit Hours: 4
The second course in a three quarter sequence in applied partial differential equations. Introduction to solution techniques using eigenvalues and Eigen functions. Presentation of Eigen functions which form orthogonal bases such as Bessel functions and Legendre polynomials.
Prerequisites: MATH 421 and MATH 341
Corequisite: MATH 354

MATH 423 - Applied Partial Diff Equ III
Lecture Hours: 4
Lab Hours: 0
Credit Hours: 4
The third course in a three term sequence. Applications of linear and weakly nonlinear partial differential equations. Analytical solution techniques for parabolic, elliptic, and hyperbolic equations. Green's functions, integral methods, shocks, and the method of characteristics.
Prerequisite: MATH 422

MATH 451 - Numerical Methods I
Lecture Hours: 4
Lab Hours: 0
Credit Hours: 4
Computer applications of matrix methods, iterative solutions of equations, and systems of equations, polynomial interpolation and curve fitting, numerical differentiation and integration.
Prerequisites: CST 116 or ENGR 266 or ENGR 267, and MATH 252 and MATH 261 or MATH 341

MATH 452 - Numerical Methods II
Lecture Hours: 4
Lab Hours: 0
Credit Hours: 4
Numerical solution of ordinary differential equations. Numerical solution of initial-value problems using Runge-Kutta methods and linear multistep methods; introduction to boundary value problems. Analysis of stability, accuracy, and implementation of methods.
Prerequisites: MATH 451 and MATH 321

MATH 453 - Numerical Methods III
Lecture Hours: 4
Lab Hours: 0
Credit Hours: 4
Numerical solution of partial differential equations. Numerical solution of boundary value problems and initial-boundary value problems using finite difference and finite element methods. Analysis of stability, accuracy, and implementation of methods.
Prerequisites: MATH 421 and MATH 452

MATH 465 - Mathematical Statistics
Lecture Hours: 4
Lab Hours: 0
Credit Hours: 4
Counting techniques, probability, discrete and continuous random variables and distribution functions, joint probability distributions; expected value, variance and covariance; decision making.
Prerequisite: MATH 254

Mechanical Engineering

MECH 107 - Seminar
Lecture Hours: 0
Lab Hours: 0
Credit Hours: 15
(Hours to be arranged each term.)

MECH 207 - Seminar
Lecture Hours: 0
Lab Hours: 0
Credit Hours: 15
(Hours to be arranged each term.)

MECH 221 - Statics
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Fundamental principles of mechanics if rigid bodies and the application of these principles to engineering problems.
Prerequisite: PHY 221
Pre- or Corequisite: MATH 252

MECH 222 - Strength of Materials I
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Internal stresses and deformations of structural members and machines when subjected to external forces.
Prerequisite: ENGR 211 or MECH 221

MECH 223 - Strength of Materials II
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
Internal stresses and deformations of structural members and machines when subjected to external forces. Analysis of stress in pressure vessels and column buckling.
Prerequisite: MECH 222

MECH 260 - Engineering Materials I
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
Survey of materials with emphasis on metals and metal alloys used in industry; their physical and chemical properties as related to structure, corrosion, and engineering applications. Diffusion mechanisms and binary phase diagrams are also examined. Tensile, impact, and fatigue failure of metallic materials. Laboratory included.
Prerequisite: CHE 201 and CHE 204, or CHE 221, or instructor consent

MECH 304 - Co-op Field Practice
Lecture Hours: 6
Lab Hours: 0
Credit Hours: 6
(Terms and hours to be arranged with approval of the curriculum coordinator.) An approved work program related to the student's field of specialization for a continuous three-month period. The employer and the type, level, and difficulty of the particular job must be approved prior to the employment period. A written comprehensive report must be submitted during the following term of residence.

MECH 307 - Seminar
Lecture Hours: 0
Lab Hours: 0
Credit Hours: 15
(Hours to be arranged each term.)

MECH 312 - Dynamics II
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Continuation of the study of kinematics and kinetics of particles and rigid bodies, with applications to mechanical systems of current interest to engineers.
Prerequisites: ENGR 212 and MATH 321

MECH 313 - Thermodynamics II
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Application of laws and principles of thermodynamics to real thermodynamic cycles. Teaches analysis of performance and design of internal and external combustion engines, steam generators, heat pumps, compressors, and refrigeration machinery.
Prerequisite: ENGR 355

MECH 315 - Machine Design I
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Study of stress and fatigue analysis as applied to machine elements.
Prerequisites: ENGR 213 or MECH 223, and MECH 260

MECH 316 - Machine Design II
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
A study of power transmission systems components, selection, and application to power transmission systems. Special consideration is given to the dynamic characteristics of the systems.
Prerequisite: MECH 315 or instructor consent

MECH 318 - Fluid Mechanics
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Covers fluid properties, fluid statics, conservation laws, pipe flow, drag, lift fluid dynamics, measurement of flow, viscous flow, laminar, and turbulent flow, and forces due to fluid motion.
Prerequisites: ENGR 211 and MATH 252

MECH 323 - Heat Transfer I
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
An introduction to the three modes of heat transfer, conduction, convection, and radiation. Teaches the analytical and empirical techniques used for solving problems in heat transfer, including those for which computer application is most suited.
Prerequisites: ENGR 318 or MECH 318, ENGR 355, and MATH 321

MECH 326 - Electric Power Systems
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
Study related to theory and application of industrial electric power systems. Topics covered include transformers, motors, generators, motor controls, and protective devices.
Prerequisites: MECH 363 and ENGR 236

MECH 351 - Finite Element Analysis
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
This course is an introduction to the use of finite analysis (FEA) in the solution of mechanical engineering problems. Existing FEA computer codes are used.
Prerequisite: MET 375
Pre- or Corequisite: MECH 315

MECH 360 - Engineering Materials II
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
This course extends the MET 160 Engineering Materials I course using a more theoretical approach. Subjects include metals, polymers, ceramics, and composites.
Prerequisites: CHE 201 or CHE 221, and MECH 260

MECH 363 - Engineering Instrumentation
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
Study of measurement techniques and equipment used in mechanical engineering. Instrumentation for measurements in mechanics, thermodynamics, fluid dynamics, and electrical systems are considered. Methods of calibration, correction, and data reduction are presented.
Prerequisite: ENGR 236
Pre- or Corequisite: ENGR 213 or MECH 223

MECH 375 - Solid Modeling
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
Introduces solid modeling techniques as applied to mechanical design. Topics include extruded and swept shapes, Boolean operations, and other construction techniques.
Prerequisite: MET 242

MECH 404 - Co-op Field Practice
Lecture Hours: 0
Lab Hours: 6
Credit Hours: 6
(Terms and hours to be arranged with approval of the curriculum coordinator.) An approved work program related to the

student's field of specialization for a continuous three-month period. The employer and the type, level, and difficulty of the particular job must be approved prior to the employment period. A written comprehensive report must be submitted during the following term of residence.

MECH 405 - Reading and Conference
Lecture Hours: 12
Lab Hours: 0
Credit Hours: 12
(Hours to be arranged each term.)

MECH 407 - Seminar
Lecture Hours: 6
Lab Hours: 3
Credit Hours: 6
(Hours to be arranged each term.)

MECH 414 - Intro to Aerodynamics
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
An introduction course on the fundamentals of aerodynamics. Includes a review of the behavior of fluids in motion, definition of the important parameters in aerodynamic behavior, and study of flow about simple aerodynamic shapes. Emphasis will be placed on low-speed aerodynamics.
Prerequisites: ENGR 355 and MECH 318

MECH 415 - Design Project
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
This course involves using material from prior course work in individual student projects.
Prerequisites: MECH 315, MECH 318, and MET 242
Pre- or Corequisite: MECH 316

MECH 417 - Fluid Mechanics II
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
Fluid Kinematics, differential analysis, similitude and modeling, and compressible flow. Computational fluid dynamics is introduced. An alternative to MECH 418. MECH 417 covers less topics/theory but does include a laboratory session.
Prerequisites: ENGR 355, MATH 321, and MECH 318

MECH 418 - Fluid Mechanics II
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
A continuation of the study of the principles and applications of fluids in engineering, including: fluid kinematics, dimensional analysis and modeling, differential analysis of fluid flow, Navier-Stokes equations, compressible flow, open-channel flow, and turbomachinery. An alternative to MECH 417. MECH 418 covers more topics/theory but does not include a laboratory session.
Prerequisites: ENGR 355, MATH 321, and MECH 318

MECH 421 - Intro to Wind Tunnels
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
An introductory course on the experimental techniques used in wind tunnel testing of aerodynamic shapes. Includes operating characteristics of wind tunnels, the characteristics of and use of models and model instrumentation, and the development of analytical techniques for reduction of wind tunnel data.
Prerequisites: MECH 318 and MECH 363

MECH 426 - Fluid Power Systems
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
A mechanical approach to industrial hydraulic applications with emphasis on selection and function of hardware and interfacing of hydraulic systems with mechanical, fluidic, and electrical/ electronic controls.
Prerequisite: MECH 318 or instructor consent

MECH 427 - Experiments in Thermodynamics
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
Application of laws and principles of thermodynamics to performance testing of heat engines. Teaches measurement of power, determination of efficiency, preparation of heat balances, analysis of combustion products, and preparation of engineering reports.
Prerequisites: MECH 313 and MECH 363

MECH 433 - HVAC
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
Heating, ventilation, and air conditioning. Application of laws and principles of thermodynamics to analysis, design, and control of mechanically controlled environments for human comfort, animal health, and food preservation. Teaches computation of heating and cooling loads, humidity control, heating, and refrigeration.
Prerequisite: MECH 323

MECH 436 - Classical Control Systems
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
Introduction to control systems. Both classic-control theory and programmable logic controllers. Topics include block diagrams, mathematical models, transfer functions, LaPlace transforms, frequency response along with control components and PLC programming.
Prerequisite: MECH 480

MECH 437 - Heat Transfer II
Lecture Hours: 1
Lab Hours: 3
Credit Hours: 2
A study of experimental heat transfer. Methods and instrumentation used for investigating heat transfer systems will be considered. Laboratory investigations include studies of heat exchangers, forced and free convection experiments, and determination of radiation and convection coefficients.
Prerequisite: MECH 323 or instructor consent

MECH 438 - Reciprocating & Turbine Engine
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Introduction to construction, operation, and theory of reciprocating and turbine engines. Students will learn engine design, history of development, theory and practice of operation.
Prerequisites: MECH 313, MECH 315, and MECH 318

MECH 475 - Parametric Modeling
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
Introduces feature-based parametric solid modeling techniques as applied to Mechanical Design. Emphasizes the concepts and practices of parametric modeling from the user's perspective. Theoretical and developmental backgrounds are also covered.
Prerequisite: MET 375

MECH 480 - Mechanical Vibrations
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
An introduction to mechanical vibration. Topics include the equations of motion, resonant frequencies, mode shapes, damping and applications. The laboratory will introduce vibration instrumentation.
Prerequisites: ENGR 212, ENGR 266, MATH 321, MATH 341, MECH 315, and MECH 363

Mechanical Engineering Technology

MET 107 - Seminar
Lecture Hours: 0
Lab Hours: 0
Credit Hours: 15
(Hours to be arranged each term.)

MET 108 - Geo Dimen and Tolerance
Lecture Hours: 2
Lab Hours: 0
Credit Hours: 2
The study and application of ANSI geometric dimensioning and tolerancing principles relative to the preparation of engineering drawings.
Prerequisite: MET 241

MET 207 - Seminar
Lecture Hours: 6
Lab Hours: 0
Credit Hours: 6
(Hours to be arranged each term.)

MET 218 - Fluid Mechanics
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Covers fluid properties, laws of fluid statics, and fluid dynamics, measurement of flow, viscous flow, laminar, and turbulent flow, flow in ducts, forces due to fluid motion, and fluid machinery.
Prerequisites: MATH 112, and PHY 201 or PHY 221

MET 232 - Thermodynamics
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
An introductory course in thermodynamics. Develops understanding of energy, heat, work, efficiency, the ideal gas law, the first and second laws of thermodynamics, and the general energy equation.
Prerequisites: MATH 252, and PHY 202 or PHY 222

MET 241 - CAD for Mechanical Design I
Lecture Hours: 1
Lab Hours: 3
Credit Hours: 2
Computer aided drafting (CAD) for mechanical design. The focus of this course is the construction of 2-D drawings using current industry software. Topics include construction principles, input schemes, command structures, and data management.
Prerequisite: ENGR 111 or instructor consent

MET 242 - CAD for Mechanical Design II
Lecture Hours: 1
Lab Hours: 3
Credit Hours: 2
Computer aided drafting (CAD) for mechanical design. The focus of this course is the construction of drawing sets using current industry software. Topics include detail part drawings, assembly drawings, and an introduction to 3-D drafting.
Prerequisite: MET 241

MET 298 - Reading and Conference
Lecture Hours: 6
Lab Hours: 0
Credit Hours: 6
(Hours and content to be arranged each term.)

MET 299 - Laboratory Practice
Lecture Hours: 0
Lab Hours: 6
Credit Hours: 6
(Hours and content to be arranged each term.)

MET 304 - MET Co-op Field Practice
Lecture Hours: 6
Lab Hours: 0
Credit Hours: 6
(Terms and hours to be arranged with approval of the curriculum coordinator.) An approved work program related to the student's field of specialization for a continuous three-month period. The employer and the type, level, and difficulty of the particular job must be approved prior to the employment period. A written comprehensive report must be submitted during the following term or residence.

MET 307 - Seminar
Lecture Hours: 0
Lab Hours: 0
Credit Hours: 15
(Hours to be arranged each term.)

MET 313 - Applied Thermodynamics
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Application of laws and principles of thermodynamics to real thermodynamic cycles. Teaches analysis of performance and design of internal and external combustion engines, steam generators, heat pumps, compressors, and refrigeration machinery.
Prerequisite: ENGR 355

MET 315 - Machine Design I
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Knowledge and skills developed in preceding courses are extended and applied to design and selection of machine elements and machines. Attention is given to functional requirements, methods of manufacture, choice of materials, and economic factors.
Prerequisites: ENGR 213 or MECH 223, and MECH 260

MET 316 - Machine Design II
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
A study of power transmission components, their selection, and application to power transmission systems. Special consideration is given to the dynamic characteristics of the systems.
Prerequisite: MET 315

MET 323 - Heat Transfer I
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
An introduction to the three modes of heat transfer, conduction, convection, and radiation. Teaches the analytical and empirical techniques used for solving problems in heat transfer, including those for which computer application is most suited.
Prerequisites: ENGR 355 and MET 218

MET 351 - Finite Element Analysis
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
This course is an introduction to the use of finite element analysis (FEA) in the solution of mechanical engineering problems. Existing FEA computer codes are used.
Prerequisite: MET 375
Pre- or Corequisite: MET 315

MET 360 - Engineering Materials II
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
This course extends the MET 160 Engineering Materials I course using a more theoretical approach. Subjects include metals, polymers, ceramics, and composites.
Prerequisite: MECH 260

MET 363 - Engineering Instrumentation
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
Study of measurement techniques and equipment used in mechanical engineering. Instrumentation for measurements in mechanics, thermodynamics, fluid dynamics, and electrical systems considered. Methods of calibration, correction, and data reduction presented.
Prerequisite: ENGR 236
Pre- or Corequisite: ENGR 213

MET 375 - Solid Modeling
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
Introduces solid modeling techniques as applied to mechanical design. Topics include extruded and swept shapes, Boolean operations, and other construction techniques.
Prerequisite: MET 242

MET 404 - MET Co-op Field Practice
Lecture Hours: 6
Lab Hours: 0
Credit Hours: 6
An approved work program related to the student's field of specialization for a continuous three-month period. The employer and the type, level, and difficulty of the particular job must be approved prior to the employment period. A written comprehensive report must be submitted during the following term of residence.

MET 405 - Reading and Conference
Lecture Hours: 6
Lab Hours: 0
Credit Hours: 6
(Hours to be arranged each term.)

MET 407 - Seminar
Lecture Hours: 6
Lab Hours: 0
Credit Hours: 6
(Hours to be arranged each term.)

MET 414 - Applied Aerodynamics
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
An introductory course on the fundamentals of aerodynamics. Includes a review of the behavior of fluids in motion, definition of the important parameters in aerodynamic behavior, and study of flow about simple aerodynamic shapes. Emphasis will be placed on low-speed aerodynamics.
Prerequisites: ENGR 355 or MET 232, and MET 218

MET 415 - Design Project
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
This course involves using material from prior course work in individual student projects.
Prerequisites: MET 218 and MET 315
Pre- or Corequisite: MET 316

MET 416 - Energy Systems
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Compares available energy resources by application of laws and principles of thermodynamics. Provides computational skills for assessment of a given resource with respect to a given application. Develops understanding of energy economics.
Prerequisites: ENGR 355 or MET 232

MET 417 - Gas Laws
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
Application of thermodynamics and fluid mechanics to the analysis of flow of both ideal and real gasses in pipes, nozzles, diffusers, compressors and turbines. The course also emphasizes the use of appropriate instrumentation.
Prerequisites: MET 218, MET 313, and MET 363

MET 421 - Wind Tunnel Technology
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
An introductory course on the experimental techniques used in wind tunnel testing of aerodynamic shapes. Includes operating characteristics of wind tunnels, the characteristics of and use of models and model instrumentation, and the development of analytical techniques for reduction of wind tunnel data.
Prerequisites: ENGR 355 or MET 232, MET 218, and MET 363

MET 426 - Fluid Power Systems
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
A mechanical approach to industrial hydraulic applications with emphasis on selection and function of hardware and interfacing of hydraulic systems with mechanical, fluidic and electrical/electronic controls.

MET 427 - Exper in Thermodynam
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
Application of laws and principles of thermodynamics to performance testing of heat engines. Teaches measurement of power, determination of efficiency, preparation of heat balances, analysis of combustion products, and preparation of engineering reports.
Prerequisites: MET 313 and MET 363

MET 433 - HVAC
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
Heating, ventilating, and air conditioning. Application of laws and principles of thermodynamics to analysis, design, and control of mechanically controlled environments for human comfort, animal health, and food preservation. Teaches computation of heating and cooling loads, humidity control, heating, and refrigeration.
Prerequisites: MET 313 and MET 323

MET 436 - Control Systems
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
An introduction to control systems. Both classic control theory and modern digital process control are considered. Topics include block diagrams, mathematical models, transfer functions, LaPlace transforms, frequency response along with control components and digital controllers.
Prerequisites: ENGR 212, ENGR 236, ENGR 355 or MET 232, MET 218, and MET 363

MET 437 - Heat Transfer II
Lecture Hours: 1
Lab Hours: 3
Credit Hours: 2
A study of experimental heat transfer. Methods and instrumentation used for investigating heat transfer systems will be considered. Laboratory investigations include studies of heat exchangers, forced and free convection experiments, and determination of radiation and convection coefficients.
Prerequisite: MET 323

MET 438 - Reciprocating & Turb Eng
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Introduction to construction, operation, and theory of reciprocating and turbine engines. Students will learn engine design, history of development, theory and practice of operation.
Prerequisites: MET 218, MET 313, and MET 315

MET 462 - Vacuum Technology
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
An introductory course defining the role of high and ultra-high vacuum in the process of high vacuum technology. Material will include such topics as vacuum pumping, vacuum gauging, processing of materials in a vacuum, evaporative deposition, sputtering, thin films, mass spectrometry, and leak detection.
Prerequisite: MET 417

MET 465 - Comput'n Strength of Materials
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Advanced topics in structural mechanics using calculus and finite element approaches. Topics include stresses and deflections of non-uniform 2-d beams; shafts and connecting rods; axisymmetric shells; circular and rectangular plates; inertial stresses from rotation and seismic effects. Applications are emphasized.
Prerequisites: ENGR 211 or MECH 222, ENGR 213, MATH 252, MECH 221, and MET 351

MET 475 - Parametric Modeling
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
Introduces feature-based parametric solid modeling techniques as applied to Mechanical Design. Emphasizes the concepts and practices of parametric modeling from the user's perspective. Theoretical and development backgrounds are also covered.
Prerequisite: MET 375

MET 480 - Vibrations
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
An introduction to mechanical vibration. Topics include the equations of motion, resonant frequencies, mode shapes, damping and applications. The laboratory will introduce vibration instrumentation such as accelerometers and spectrum analyzers.
Prerequisites: ENGR 212, ENGR 266, MATH 321, MECH 315, and MECH 363

Manufacturing Engineering Technology

MFG 101 - Intro to Manufacturing
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
An introduction to the manufacturing engineering technology discipline. Orientation to the use of personal computers. Instruction in problem solving and laboratory procedures emphasized. Laboratory provides demonstration and

practice in a variety of manufacturing equipment and procedures.

MFG 103 - Intro Welding Proc
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
Applications of welding in modern industry. Topics include: Oxyacetylene welding and cutting, shielded metal arc welding, gas tungsten arc welding, gas metal arc welding, and robotic welding.
Prerequisite: Enrolled in any MMET program or instructor consent

MFG 107 - Seminar
Lecture Hours: 0
Lab Hours: 0
Credit Hours: 15
(Hours to be arranged each term.)

MFG 112 - Intro to Mfg Processes
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
A survey of common manufacturing processes, including a history of manufacturing technology. Manufacturing economic considerations. Influence of product design on process selection. Manufacturing taxonomy, surface finish, tolerances, and functional specifications.

MFG 120 - Intro Machining Proc
Lecture Hours: 2
Lab Hours: 6
Credit Hours: 4
An introductory course in metal removal processes emphasizing drilling, milling, and lathe processes. Included tool bit grinding. Emphasis on production speeds and feeds.
Prerequisites: ENGR 111 and MATH 100

MFG 204 - Data Management
Lecture Hours: 2
Lab Hours: 0
Credit Hours: 2
Current topics in data acquisition and management.

MFG 207 - Seminar
Lecture Hours: 6
Lab Hours: 0
Credit Hours: 6
(Hours to be arranged each term.)

MFG 220 - Mfg Processes II
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
Advanced concepts in material removal. Turning, milling, shaping, and drilling. Cutting tools and cutting requirements.
Prerequisites: MECH 260, MET 241, and MFG 120

MFG 223 - Cast & Mold Proc
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Casting and molding processes including: pattern making, casting and molding methods, mold and core making, pouring, cleanup, sand conditioning and testing, quality considerations and economic factors.
Prerequisites: ENGT 115 and MECH 260

MFG 245 - Electronics Mfg
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Processes and materials specific to the production of printed circuit board and integrated circuit components. Topics include surface mount technology, vacuum system theory, photolithography, etching and deposition processes, micro bonding, and component packaging.
Prerequisites: CHE 101 and MET 112

MFG 275 - CAD for Manufacturing
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
Computer aided drafting for manufacturing. Presents equipment and programs from the user's perspective. Topics include construction principles, input schemes, command structures, and data management.
Prerequisite: One computer language

MFG 295 - Individual Studies
Lecture Hours: 6
Lab Hours: 0
Credit Hours: 6
(Hours to be arranged each term.)

MFG 298 - Reading and Conference
Lecture Hours: 6
Lab Hours: 0
Credit Hours: 6
(Hours to be arranged each term.)

MFG 299 - Laboratory Practice
Lecture Hours: 0
Lab Hours: 6
Credit Hours: 6
(Hours to be arranged each term.)

MFG 307 - Seminar
Lecture Hours: 6
Lab Hours: 0
Credit Hours: 6
(Hours to be arranged each term.)

MFG 313 - Mfg Analysis & Planning
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Analysis and planning of manufacturing methods, procedures and equipment. Includes designing for manufacturing efficiency, tolerance analysis, equipment and resource allocation and scheduling.
Prerequisites: MET 242, MFG 112, and MFG 120

MFG 314 - Geom Dimension/Tolerance
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
The study and application of ANSI and ISO geometric dimensioning and tolerancing principles and practices relative to product design and manufacturing operations.
Prerequisites: MATH 112 and MET 242

MFG 317 - Machine Element Dsgn
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Stress calculations and design of machine elements for general applications. Theories of failure, fatigue considerations, and material selection of shafts and associated parts, gear and belt drives, bearings, power screws, threaded fasteners, riveting, welding, and springs.
Prerequisites: ENGR 213 or MECH 222, and MET 241, or instructor consent

MFG 325 - Princ Mtrlgy, Mach, Weld
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Measuring techniques using precision devices. Metal removal processes such as lathe, mill, and grinder. Correct use of tools and cutting parameters. Basic welding processes and theory.

MFG 326 - Solid Mechanics
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Concentrated study of statics and strength of materials comprising the principles of equilibrium, strain-stress relationships, and analysis of internal stresses for different loading systems.
Prerequisite: MATH 112

MFG 331 - Industrial Controls
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
Fundamentals of control of manufacturing processes. Applications of relay logic, input and output devices, and programmable logic controllers (PLC). Design of complete control circuits, selection of components, and cost estimation. PLC programming for discrete event control and for analog applications.
Prerequisite: ENGR 326

MFG 333 - Stat Methods Qual/Improv
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Strategies for continuous manufacturing process improvement. Graphical and numerical methods for data analysis. Methods for manufacturing process control and acceptance criteria.
Prerequisite: MATH 361

MFG 334 - MFG Group Project
Lecture Hours: 1
Lab Hours: 6
Credit Hours: 3
Development of a product by a group of manufacturing students working together. This includes creating or modifying the design of a product, writing operation sheets, specifying materials, tools and

equipment needed, design of special tooling, setup and operation of equipment and actual manufacturing of the project.
Prerequisite: MFG 342

MFG 341 - Numerical Control Prog
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
Introduction to manual numerical control programming. Includes interpreting part drawings, process planning, machining setup and sequence. Program debugging and introduction to tool path simulation and computer-aided programming tools.
Prerequisites: MATH 112, MET 242, and MFG 120

MFG 342 - Computer Aided Machining
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
Development of CNC machine tool manufacturing programs using computer-aided process planning and advanced CAD/CAM software. Emphasis on analysis and planning required for successful CNC production, development of CAD drawings and solid models for CAM program development, toolpath simulation, and manufacturing engineering issues.
Prerequisites: MET 375 and MFG 341

MFG 343 - Manufacturing Tool Dsgn
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Fundamentals of jig and fixture design. Locating and clamping methods for manufacturing production. Design of sheet metal stamping, piecing, and forming tools. Study of the effect of manufacturing machines and production methods on tooling design.
Prerequisites: MET 315 or MECH 315, MFG 313, MFG 314, and MFG 341, or instructor consent

MFG 344 - Dsgn of Mfg Tooling
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
Using material from prior courses students work in individual and team design projects. Design and analyze a variety of manufacturing fixtures, jigs, molds, and stamping dies.
Prerequisite: MFG 343

MFG 351 - Microelec MFG Proc I
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
A three quarter sequence providing in-depth theory of the processes used in the manufacture of electronic components. Primary topics include integrated circuits, printed circuits, electronic assembly. Vacuum system theory, photolithography, process specific chemistry, etching and deposition processes, and surface mount technology.
Prerequisites: CHE 101 and PHY 202

MFG 352 - Microelec MFG Proc II
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
A three quarter sequence providing in-depth theory of the processes used in the manufacture of electronic components. Primary topics include integrated circuits, printed circuits, electronic assembly. Vacuum system theory, photolithography, process specific chemistry, etching and deposition processes, and surface mount technology.
Prerequisite: MFG 351

MFG 353 - Microelec MFG Proc III
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
A three quarter sequence providing in-depth theory of the processes used in the manufacture of electronic components. Primary topics include integrated circuits, printed circuits, electronic assembly. Vacuum system theory, photolithography, process specific chemistry, etching and deposition processes, and surface mount technology.
Prerequisite: MFG 352

MFG 404 - MFG Co-Op Field Practice
Lecture Hours: 0
Lab Hours: 0
Credit Hours: 3
An approved work program related to the student's field of specialization for a continuous three-month period. The employer and the type, level, and difficulty of the particular job must be approved prior to the employment period. A written comprehensive report must be submitted during the following term of residence. Terms and hours to be arranged with approval of curriculum coordinator.

MFG 405 - Reading and Conference
Lecture Hours: 6
Lab Hours: 0
Credit Hours: 6
(Hours to be arranged each term.)

MFG 407 - Seminar
Lecture Hours: 6
Lab Hours: 0
Credit Hours: 6
(Hours to be arranged each term.)

MFG 408 - Workshop
Lecture Hours: 6
Lab Hours: 0
Credit Hours: 6
(Hours to be arranged each term.)

MFG 415 - Finishing Methods
Lecture Hours: 2
Lab Hours: 0
Credit Hours: 2
Review of material finishing technologies with focus on functional requirements of final product, life-cycle environmental considerations, and manufacturing technologies for material finishing.
Prerequisite: MECH 260

MFG 420 - Mfg Process III
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Introduction to less conventional and recently developed manufacturing processes and materials. Emphasis on understanding unique characteristics, advantages, limitations, and applications. Analysis required for selection of appropriate materials and processes. Examples of computer programs that aid the selection process.
Prerequisites: MATH 112, MET 242, MFG 120, and PHY 221, or instructor consent

MFG 425 - Plastic Manufacturng Processes
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
Fundamentals of polymer science and plastic manufacturing methods. Introduction to the effect of chemistry and morphology of plastics on material selection, product design, and process design. Emphasis is on the thermoplastic processes such as injection molding.
Prerequisites: MECH 260 and MET 375, or instructor consent

MFG 445 - Plant Layout and Handling Syst
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
In-depth study of facilities planning for manufacturing engineers. Focus is on layout optimization algorithms and applications, work cell design, warehouse design, materials handling systems, process/product/material/labor cost estimates and evaluations, and agile manufacturing.
Prerequisites: MFG 112 and MFG 313

MFG 447 - Lean Manufacturing
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
Introduction of principles, techniques, and skills of lean manufacturing. Process optimization and quality improvement for manufacturing. Plant layout, design and job scheduling. JIT skills, such as Kaizen, Kanban, value added analysis and one-piece flow to reduce inventory and waste.
Prerequisite: MFG 333

MFG 453 - Automation & Robotics
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
Study of the appropriate level of manufacturing automation based upon economics and productivity. Discussion of robotics and a study of automated

manufacturing including automatic machine design and material handling.
Prerequisite: Senior standing in MET or MfgET or instructor consent

MFG 454 - Thermal Manufacturing Process
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Fundamentals of thermal energy analysis, including introduction to thermodynamics and heat transfer. Emphasis is on solving manufacturing related problems in thermal process control and analysis.
Prerequisite: MATH 252

MFG 456 - Materials Science
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Study of the relationship of a material's structure to its properties. Materials studied include nonferrous metals, polymers, and ceramics, composites, and electronics materials.
Prerequisite: MFG 420

MFG 465 - Adv Welding Methods
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
High energy density, solid state, and plastics welding processes. Welding metallurgy supports, metal combination choices and solutions to typical welding problems. Codes, procedure qualification, welding design and nondestructive testing.
Prerequisites: MECH 260 and MFG 103

MFG 503 - Thesis
Lecture Hours: 9
Lab Hours: 0
Credit Hours: 9
Course may be repeated for credit.

MFG 507 - Seminar
Lecture Hours: 6
Lab Hours: 0
Credit Hours: 6
(Hours to be arranged each term.)

MFG 521 - MFG Manag Tm in Global Entrpr
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Concepts and theories needed to understand the management of people, work groups, and organizations in a global environment. Exploration of cultural differences, organizations, communication and business relationships; strategic thinking in a global context, and international e-communications. Emphasis on contemporary case studies regarding the operational problems facing the international firm.

MFG 522 - Mfg Business Philosophies
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Contemporary world class manufacturing concepts and philosophies including Just-in-Time (JIT) applications for manufacturing and inventory management; methods and practices of total quality control in manufacturing; and continuous improvement techniques in manufacturing. Focus on contemporary cases in global manufacturing.

MFG 523 - Capitalization Prin for Manfg
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Theory and concepts of capitalization for manufacturing assets; land, buildings, and equipment. Historical cost for valuing an asset. Net income, real and tax depreciation, and timing the disposal or exchange of assets. Exploration of capitalization of cost, post-acquisition asset costs, interest capitalization and expense, asset impairments, and multinational capital budgeting and financial management.

MFG 524 - Proj & Budget Planning for MFG
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Exploration of the theories, tools, and techniques needed to effectively plan and manage manufacturing projects and budgets. Development of the characteristics of project plans including scope of work statements, work breakdown structure, project schedules, schedule and budget metrics, and project change cost analysis. Core topics include cost, time, and resource estimation, management and budgeting.

MFG 525 - International Economics MFG
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Exploration of international economics. Impact on manufacturing industries. Focus on the foundations of international trade including classical and modern theories of production and industrial organization. Free trade policies; foreign competition; direct foreign investment, fiscal and monetary policy; tariffs, quotas, and subsidies. International monetary market on production, and anti-globalization politics. Concentration on contemporary cases in manufacturing.
Prerequisite: ECO 201 and ECO 202 or equivalent (see instructor)

MFG 531 - Engineering Mechanics
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Fundamentals of statics. Dry, viscous, and rolling friction. Kinematics of particles: rectilinear and curvilinear motion. Kinetics of particles: work and energy, impulse and momentum. Kinematics of rigid bodies: translation and rotation. Kinetics of rigid bodies: work and energy, impulse and momentum. Fundamentals of stress analysis.

MFG 533 - Thermal Process & Tech in MGF
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Review of the laws of thermodynamics. Review of heat transfer including conduction, convection, and radiation. Vacuum technology. Autoclave processes. Cryogenics: materials, techniques, and safety. Plasma processes. The processing of non-metallics. The processing of insulation materials. Energy costs and conservation in manufacturing processes.

MFG 534 - Desgn Tech/Manufacturability
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Cutting costs and improving productivity. Managing the manufacturing supply chain. Reducing time to market. Establishing core competencies and maintaining vital corporate best practices. The role of standards and lean manufacturing in design.

MFG 535 - Product Life Software
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Use of high-end enterprise-wide software products for integrating design, automating the workflow, and comprehensively controlling security. Revisions management over all types of data. Creating document links. Leveraging subject matter experts across the extended enterprise.

MFG 536 - Auto Tech for Tool Path Gener
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Reviewing and validating manufacturing processes for administrators, managers, and designers. Reviewing the creation of tool paths using standard 3D and 2D mechanical design tools and the generative 2.5-axis and 3, 4, and 5-axis surface machining NC software tools. Controller, machine, and software selection and integration.

MFG 537 - Prod Data Mngm and Conf Cont
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Capturing intellectual property at its source from CAD design, manufacturing and maintenance, driving the product information across the extended enterprise, and enabling its use in other branches and partners in the enterprise. Creating the integration of better and more efficient decisions and processes over the life cycle of the product.

MFG 538 - Special Problems In MFG Softwr
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Independent study using advanced functionality in high-end manufacturing and enterprise software. Approval of faculty advisor required.

MFG 562 - Adv Materials Science & Tech
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Advanced engineering materials. Recent advances in development and applications of metals, polymers, ceramics, and composites. Emphasis on the relationship between structure and properties. Manufacturing processes explored. Application of established standards for materials properties determination.

MFG 563 - Inventory/Supply Train Mgt
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Introduction of concepts, principles, techniques, strategies and applications related to demand forecasting, production planning, performance measurements, quality control, inventory control and continuous improvement for manufacturing systems.

MFG 564 - Quality Concepts/Philosophies
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Understanding quality, Models and Framework for TQM, Leadership & Commitment, Planning, Strategy & Goal deployment, Partnerships & Resources, Performance measurement, Self-assessment, Audits & Reviews, Benchmarking, Process Management, Continuous Improvement; Culture change through teamwork, Communication, Implementing TQM, and Case studies.

MFG 595 - Selected Grad Topics in Manf
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Manufacturing related topics in engineering science and design. Manufacturing related topics in software and computer integration. Manufacturing related topics in business and management. Course may be repeated for credit.

MFG 596 - Selected Topics/Eng Sci & Design
Lecture Hours: 6
Lab Hours: 6
Credit Hours: 6
Manufacturing related topics in engineering science and design. Course may be repeated for credit.

MFG 597 - Selected Topics/Comp Integrat
Lecture Hours: 6
Lab Hours: 6
Credit Hours: 6
Manufacturing related topics in software and computer integration. Course may be repeated for credit.

MFG 598 - Selected Topics/Mat & Process
Lecture Hours: 6
Lab Hours: 0
Credit Hours: 6
Manufacturing related topics in materials and processing technology. Course may be repeated for credit.

MFG 599 - Selected Topics/Finance & Mngt
Lecture Hours: 6
Lab Hours: 6
Credit Hours: 6
Manufacturing related topics in business and management. Course may be repeated for credit.

Marriage and Family Therapy

MFT 500 - Child & Adolescent Development
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Course explores the transaction between biological, psychosocial, cultural, and development from conception through adolescence including an understanding of the development of characteristics such as resilience.

MFT 501 - Adult Development
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Course provides a broad understanding of the nature and needs of individuals in adulthood. Developmental theory from early adulthood through aging and death is explored including aspects of physical, cognitive, emotional, social, and spiritual development.

MFT 502 - Lifespan Development
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Course addresses biological, neurological, psycho-social, cultural, and environmental factors affecting human development from conception through late adulthood.

MFT 510 - Introduction to MFT
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Course presents an introduction to the foundations of family therapy, including the historical development of the field and the fundamental concepts associated with family therapy.

MFT 511 - Fmly Therapy Theory & Prac I
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Course covers the foundational principles of family systems theory and practice and begins a study of the classic models of family therapy.

MFT 512 - Fmly Therapy Theory & Prac II
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Course is a continuation of Family Therapy: Theory and Practice I. A comprehensive survey of the models of family therapy continues in the course with an exploration of the role of language, meaning, and process in relationships.

MFT 513 - Advanced Family Therapy
Lecture Hours: 3
Lab Hours: 0
Credit Hours:
This course prepares student for Clinical Practicum. It includes review of integration of family therapy theory and practice from first contact through assessment, diagnosis, consultation, treatment planning, interventions, referrals, evaluation and termination. Stages of therapist development and stages of development in clinical supervisory relationships are addressed, with emphasis on demonstration of person and professional competencies expected of MFT's and MFT students.

MFT 520 - Counseling: Theory & Skills
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Course introduces students to basic skills in attending behavior, clinical interviewing, crisis intervention, treatment planning, progress notes, clinical intervention, and collateral consultation and referral.

MFT 521 - Child & Adolescent Therapy
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Course presents a variety of psycho-therapeutic modalities, offering the student an opportunity to develop basic child and adolescent therapy skills, assessments, and treatment strategies, including Play Therapy. The impact of development aspects, family dynamics, the social environment, family violence, and trauma is addressed.

MFT 522 - Couples Therapy
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Course examines the psychotherapeutic theories and processes for the assessment

and treatment of a wide range of relational issues.

MFT 523 - Group Therapy
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Course provides a broad understanding of group development, dynamics, and therapy. Major theoretical approaches and group leadership styles are discussed.

MFT 524 - Play Therapy
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Examination of philosophy and rationale for play therapy with children and pre-adolescents. Focus on the goals of play therapy, the role of the play therapist, the developmental use of play and other expressive/creative arts and activities with children and pre-adolescents, application of methods and skill; and adapting use of play therapy with adolescents and families.

MFT 525 - Trauma and Recovery
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Overview of the sociopolitical context of trauma and its impact on diverse populations of individuals, families, and communities. The course examines evidence-based approaches of addressing trauma on multiple system levels through applications to case conceptualization and treatment planning with several populations of survivors including survivors of mass disasters, childhood abuse and domestic violence as well as veterans, refugees, and torture survivors.

MFT 530 - Adult Psychopathology & Dx
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Course is on the assessment, diagnosis, prognosis, and treatment of personality and behavioral disorders in adulthood. Emphasis is on the assessment and multi-axial diagnosis of disorders using the current edition of the DSM from a relational perspective.

MFT 531 - Child & Adolescent Psycho & Dx
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Course provides an understanding of the broad range of childhood and adolescent problems and disorders and explores the major psychopathologies of childhood and adolescence. Emphasis is on the assessment and multi-axial diagnosis of disorders using the current edition of the DSM from a relational perspective.

MFT 532 - Psychopathology & the Family
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Course focuses on the etiology of family dysfunction, specifically from a dual function of individual and systems psychopathology. An exploration of the influence of the family on the development, maintenance, and prevention of behavior, substance abuse, and co-occurring disorders is covered including family structure, environmental factors, socioeconomic stressors, educational level, parenting, cultural dynamics, and family life cycle issues. A review of the seminal and current research findings on the role of the family in the development and maintenance of behavior disorders and the best practices for treating them is provided.

MFT 533 - Violence & Abuse in Int. Rel.
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Study of contemporary understanding, assessment and treatment when violence and abuse occurs in intimate relationships. Includes physical and emotional abuse, neglect, sexual molestation; the dynamics violence in families, and resulting evidence of trauma.

MFT 534 - Psychological Assessment
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
This course provides students with a broad understanding of the clinical uses of psychological tests, including an introduction to the major types of instruments and understanding test results. An overview of the variety of assessment and diagnostic tools used to assess behavioral, psychological and relationship problems.

MFT 540 - Research Methods
Lecture Hours: 4
Lab Hours: 0
Credit Hours: 4
Course provides a survey of key concepts in social science research including sampling, measurement, research ethics, and design. Additional topics include the evidence base for clinical research, the evaluation of interventions, and pseudoscientific concerns in clinical research. Emphasis is placed on the review, evaluation, and application of professional literature to clinical practice in marriage and family therapy.

MFT 550 - Professional Studies: Ethics
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Course introduces students to the legal, ethical, and moral issues related to the practice of marriage and family therapy in the states of Oregon and California. Professional ethics codes and moral dilemmas are studied.

MFT 560 - Dev. Cultural Competencies
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Course evaluates students' awareness of divergent cultural values, assumptions, and family dynamics and is designed to sensitize students to the impact of culture in Marriage and Family Therapy.

MFT 561 - Sexuality and Therapy
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Course reviews human sexuality in contemporary society for biological, psychological, social, and cultural perspectives. An overview of the models of sex therapy and treatment strategies utilized in treating sexual dysfunction is provided.

MFT 562 - Rural Mental Health Care
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Development of the knowledge and skills required to address the unique mental health care needs of rural populations.

MFT 563 - Psychopharmacology
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Course introduces the common physical and medical issues that relate to the practice of marriage and family therapy. The biological and neurological bases of human behavior and use of psychotropic medications as an adjunctive therapy to psychotherapy is covered. Current information on the classes of medications and their use.

MFT 564 - Sub. Abuse & Co-Occurring Dis.
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Course provides an introduction to substance abuse and co-occurring disorders including a careful examination of the diagnostic criteria in the current edition of the DSM. Assessment procedures and treatment issues are discussed with emphasis given to evidence-based treatment approaches.

MFT 565 - Mental Health Care & Tech.
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Examination of contemporary technology innovations and their practical and ethical use in mental health, with particular attention to strengthening rural mental health care services.

MFT 566 - Med. Family Therapy in Rural Areas
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Study of the knowledge and skills required to work in the rapidly developing multidisciplinary field of medical family therapy. Includes emphasis on addressing rural mental health care needs with integrated health care teams that address biomedical and psychosocial needs of the whole person and family system.

MFT 567 - Intro to Substance Abuse Disorders and Addiction
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
A course about the etiology, conceptualization, and treatment of substance use and co-occurring disorders within the context of family systems. Special consideration is given to the impact of substance abuse and addiction on couple and family systems. Systemic treatment options are discussed with an emphasis on the importance of including family systems and positive supports in the recovery healing process.

MFT 568 Medical Family Therapy in Rural Areas II
Lecture Hours: 3
Lab Hours:
Credit Hours:
Continuation of MFT 566, emphasizing advanced study of the knowledge and skills required to work in the rapidly developing multidisciplinary field of medical family therapy. Includes emphasis on addressing rural mental health care needs with integrated healthcare teams that address biomedical and psycho-social needs of the whole person and family systems.

MFT 569 - Families, Substance Abuse and Addiction
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
A course about the etiology, conceptualization, and treatment of substance use and co-occurring disorders within the context of family systems. Special consideration is given to the impact of substance abuse and addiction on couple and family systems. Systemic treatment options are discussed with an emphasis on the importance of including family systems and positive supports in the recovery healing process.

MFT 571 - Clinical Practicum II
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
This course is the second in a supervised experience in an approved clinical setting providing direct therapy services. Students also attend a weekly seminar led by a faculty member where they will present individual, marital, and family therapy cases, present and evaluate digitally recorded sessions, and consult with faculty and clinical peers. Seminar time will also be spent preparing students for the Clinical Evaluation Project (CEP) capstone project.

MFT 572 - Clinical Practicum III
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
This course is the third in a series of one term supervised experiences in an approved clinical setting providing direct therapy services. Students also attend a weekly seminar led by a faculty member where they will present individual, marital, and family therapy cases, present and evaluate digitally recorded sessions, and consult with faculty and clinical peers. Seminar time will also be spent preparing students for the Clinical Evaluation Project (CEP) capstone project.

MFT 573 Clinical Practicum IV
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
This course is the fourth in a series of one term supervised experience in an approved clinical setting providing direct therapy services. Students also attend a weekly seminar led by a faculty member where they will present individual, marital, and family therapy cases, present and evaluate digitally recorded sessions, and consult with faculty and clinical peers. Seminar time will also be spent preparing students for the Clinical Evaluation Project (CEP) capstone project.

MFT 581 - Pharmacology of Substance Use Disorders
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
An introduction to the psychopharmacology of alcohol and other drugs. An emphasis is given to the behavioral, psychological, physiological, and social effects of alcohol and other drugs on the brain, the body, and relationships. Symptoms of withdrawal from psychoactive substances are highlighted. Collaboration between mental health practitioners, addictions counselors, and medication providers is addressed.

MFT 582 - Contemporary Issues in MFT and Addiction
Lecture Hours:
Lab Hours:
Credit Hours:
A research-focused course examining contemporary treatment and prevention at the intersection of Marriage and Family Therapy and substance abuse and addiction treatment. Topics include contemporary evidenced-based relationally focused substance abuse and therapy approaches, sociopolitical influences on family health and addictions treatment, current drug trends in America, gambling and process addictions, and health policy and prevention strategies. Students will develop a final research project based on a contemporary topic of interest.

MFT 592 - Self of the Therapist and MFT
Lecture Hours: 2
Lab Hours: 0
Credit Hours: 2
A course designed to address personal and professional development related to the ability to actively and purposefully choose how to use self therapeutically in a therapist-client relationship. Focus is on identifying one's own background, culture, beliefs and values, strengths and woundedness, and addressing how these factors influence therapeutic relationships. An articulation of therapist world views is highlighted.

MFT 593 - Theories of Change in MFT
Lecture Hours: 2
Lab Hours: 0
Credit Hours: 2
A course designed to facilitate the development and articulation of an integrated theory of change. Focus is on connecting therapist worldviews and identifies to overarching systemic MFT theories and interventions. The culmination of this course is the development of an integrated theory of change grounded in systemic theory and interventions. Students create a written and oral presentation of their integrated theory.

MFT 594 - Capstone
Lecture Hours: 2
Lab Hours: 0
Credit Hours: 2
An integrated clinical skills application course designed to facilitate the application of self of therapist and therapist world view, with student identified integrated theory of change. Students identify a clinical emphasis area and provide written, oral, and video evidence of the application of knowledge and skills gained throughout the MS MFT program to this identified clinical emphasis.

MFT 598 - Practicum
Lecture Hours: 4
Lab Hours: 0
Credit Hours: 4
Supervised practical experience across one practicum experience utilizing role playing, co-therapy, and videotaping.

MFT 599 - Internship
Lecture Hours: 8
Lab Hours: 0
Credit Hours: 8
Supervised practical experience across 3 terms for a total of 700 hours in preparation for supervised practice, 280 hours of direct client contact and the remaining hours in supervisory and training activities and administrative duties related to the profession.
Prerequisite: Approval of internship coordinator.

Management

MGT 107 - Seminar
Lecture Hours: 0
Lab Hours: 0
Credit Hours: 15
(Hours to be arranged each term.)

MGT 207 - Seminar
Lecture Hours: 0
Lab Hours: 0
Credit Hours: 15
(Hours to be arranged each term.)

MGT 212 - Fund of Renewable Energy Mgt
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Explores primary energy sources available for power generation. Includes cost comparisons of traditional sources (gas, coal, nuclear, hydro) and renewable sources (solar, geothermal, wind, biofuels, wave and tidal). Evaluates and benchmarks benefits of traditional versus renewable energy sources, long-term vs. short-term feasibility and strategic decision-making in energy generation and utilization.
Prerequisites: ACC 201 and REE 201

MGT 307 - Seminar
Lecture Hours: 0
Lab Hours: 0
Credit Hours: 15
(Hours to be arranged each term.)

MGT 321 - Operations Management I
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Functions of the operations division within the organizational structure. Manufacturing and service organizations reviewed. Capacity planning with forecasting and material requirements planning. Introduction to Just-In-Time concepts.
Prerequisite: BUS 215 or BUS 304 or BUS 317

MGT 322 - Operations Management II
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Supply chain management for service and manufacturing companies. Covers flow of goods and services through relationships with business customers, suppliers and partners. Students learn how to manage strategic, operational and tactical planning using best-known practices and efficient use of information systems. Evaluate and design effective supply chains.
Prerequisite: MGT 321

MGT 323 - Operations Management III
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Effective budgeting methods for industrial environments. Budget planning, formation and cost controls. Flexible budgets and expense management. Manufacturing/non-manufacturing costs, and cost/contribution analysis.
Prerequisite: ACC 203 with grade "C" or better

MGT 335 - Project Management
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Advanced application of the Critical Path Method to organization and control of project implementation. Applications software will be used to create and evaluate project networks and to develop management reports.
Prerequisite: BUS 215 or BUS 304 or BUS 314 or BUS 317

MGT 345 - Engineering Economy
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Capital expenditure, economic life and replacement analysis based on net present value, periodic costs, internal and incremental rates of return. Coverage of compound interest, value flows, economic equivalencies, depreciation, taxes and inflation.
Prerequisite: MATH 105 or MATH 111

MGT 391 - Co-op Field Practice
Lecture Hours: 0
Lab Hours: 9
Credit Hours: 3
Credit will be given for an approved work program related to the student's field of specialization for a continuous 10 week period. The employer and the type, level and difficulty of the particular job must be approved by the Management Department prior to employment.

MGT 392 - Co-op Field Practice
Lecture Hours: 0
Lab Hours: 9
Credit Hours: 3
Credit will be given for an approved work program related to the student's field of specialization for a continuous 10 week period. The employer and the type, level and difficulty of the particular job must be approved by the Management Department prior to employment.

MGT 407 - Seminar
Lecture Hours: 0
Lab Hours: 0
Credit Hours: 15
(Hours to be arranged each term.)

MGT 421 - Quality Management
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Qualitative and quantitative methods of quality assurance in manufacturing and service industries. Assessing quality systems using the ISO 9000 series of standards. Application of basic statistical techniques including control charts, sampling procedures, and graphical analysis to assess quality performance. Use of computing systems in establishing quality assurance.
Prerequisite: MATH 361

MGT 422 - Materials Management
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Approaches to materials management common to production and service industries. Demand forecasting, inventory management, scheduling, requirements planning and capacity planning using qualitative and quantitative methods. Application of computing systems in materials management processes.
Prerequisite: MGT 321

MGT 423 - Logistics Management
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Approaches to warehousing practices and distribution of goods and services across the supply chain. Warehouse justification and decisions. Procurement, packaging, handling, transport and ownership arrangements. Relationship management, sustainability and risk assessment.
Prerequisite: MGT 322

MGT 461 - Lean/Six Sigma Management I
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Lean thinking as applied to production and service operations. Kaizen, kaikaku, pull production and systems, value stream mapping and analysis. Standardized work charts and combination tables to streamline work content and achieve flow. Identifying sources of muda and its elimination.
Prerequisite: BUS 215 or BUS 304 or BUS 317

MGT 462 - Lean/Six Sigma Management II
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Overview course of Six Sigma management roles, responsibilities and terminology. Students will understand the tools and the phases of the DMAIC model and explore business cases to understand how Six Sigma techniques are applied to business.
Prerequisite: MATH 361

MGT 463 - Lean/Six Sigma Management III
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Deployment and management of Lean Six Sigma within the enterprise. Planning and assessment of deployment sustainability, infrastructure, success factors and metrics that describe the value proposition associated with institutionalizing large

strategic initiatives such as Lean Six Sigma.
Prerequisite: MGT 462

Management Information Systems

MIS 101 - Word Processing Software Lab
Lecture Hours: 0
Lab Hours: 3
Credit Hours: 1
Word processing lab using Microsoft Word software. Includes creating and editing documents, letters, Web pages, forms, labels, newsletters, research papers, an index and table of contents.

MIS 102 - Spreadsheet Software Lab
Lecture Hours: 0
Lab Hours: 3
Credit Hours: 1
Spreadsheet lab using Microsoft Excel software. Includes creating worksheets, charts, formulas, functions, what-if analysis, sorting, multiple worksheets, workbooks, templates, pivot tables and importing of data.

MIS 103 - Presentation/Graphics Sftwr Lb
Lecture Hours: 0
Lab Hours: 3
Credit Hours: 1
Presentation graphics lab using Microsoft PowerPoint software. Creation of presentations for use on paper, overhead transparencies, on a projection device, and Internet virtual presentations. Includes use of text, graphics, charts and multimedia applications to create professional-looking presentations.

MIS 107 - Seminar
Lecture Hours: 0
Lab Hours: 0
Credit Hours: (Hours to be arranged each term.)
(Hours to be arranged each term.)

MIS 113 - Intro to Database Systems
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
Introduces concepts of desktop computer-based database systems. Topics include database management issues, database design, creating and maintaining a database, normalization, table structures, and creating user queries, reports, and forms. Basic database security is discussed.

MIS 115 - Visual BASIC Programming
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Computer concepts and problem solving methods in the Windows environment using Visual BASIC. Topics include algorithms, simple data types, condition and iterative structures, functions and procedures, and the program documentation.
Prerequisite: MATH 100 or instructor consent

MIS 116 - C++ Programming I
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Computer concepts and problem solving methods using C++ programming language. Topics include: algorithms, simple data types, conditional and iterative structures, function definition, structured programming and documentation. Cannot be taken for graduation credit if student has completed CST 116.
Pre- or Corequisite: MATH 111

MIS 118 - Intro to Programming in C#
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
An introduction to basic computer programming concepts in the C# programming language. Topics include algorithms, simple data types, conditional and iterative structures, functions and procedures, and code documentation.
Prerequisite: MATH 111 or instructor consent

MIS 126 - C++ Programming II
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Solving complex problems using advanced features of the C++ language. Topics include function usage, pointer data type, dynamic memory allocation, string manipulation, and structure and union data types. Emphasis is on structured program design techniques. Cannot be taken for graduation credit if student has completed CST 126.
Prerequisite: MIS 116 with grade "C" or better, or instructor consent

MIS 130 - Computer Organization
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Introduces number systems, Boolean algebra, computer arithmetic and basic computer structures. Control unit functions. Laboratory exercises on gates, sequential elements and counters, and completion of a project. Cannot be taken for graduation credit if student has completed CST 130.
Corequisite: MATH 100

MIS 136 - OOP with C++
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
A study of object oriented programming with C++. Beginning and intermediate concepts are covered including classes, objects, member functions, overloading, inheritance, polymorphism, templates, and virtual functions. This course prepares students with a strong C background for upper division course work using C++. Cannot be taken for graduation credit if student has completed CST 136.
Prerequisite: MIS 126 with grade "C" or better

MIS 145 - Intro to PC Hardware/Software
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
An introduction to PC hardware and software that prepares students as an entry-level PC technician. The course covers topics including: PC system components, peripheral devices, data storage, networking, printing, mobile devices, operating system installation and management, file management, basic data security, and the troubleshooting process.

MIS 206 - Intro to Mgmt Info Sys
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Introduction to key components in information systems. Identification of major hardware components and primary categories of software applications. Data resource management concepts; elements of how information systems work to support problem solving and business opportunities. Ethics of information systems usage.

MIS 207 - Seminar
Lecture Hours: 6
Lab Hours: 0
Credit Hours: 6
(Hours to be arranged each term.)

MIS 215 - Bus Appl Programming
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Object-oriented and/or procedural languages employed with an emphasis on structured design, user interface design and error processing. Utilizing advanced language elements and program structures to integrated software development with data management.
Prerequisites: MIS 115 and MIS 275 with grade "C" or better, or instructor consent

MIS 218 - Intermediate Programming in C#
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Intermediate level object-oriented programming in the C# language with an emphasis on structured design, user interface design and error processing. Introduction to advanced language elements and program structures to integrate data stored in database systems into simple business applications.
Prerequisites: MIS 275 and MIS 118 with grade "C" or better

MIS 225 - Business on the Internet
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4

The role of the Internet and related technologies in modern business and electronic commerce. Hands on course for creating dynamic Web pages. Emphasizes Internet marketing and web page editor with hypertext markup language (HTML) with some exposure to Java Script.

MIS 240 - Intro to Linux OS
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Introduces the fundamental concepts of Linus operating systems. Topics include components and functions of an operating system, installing and configuring Linux operating systems, file systems, permissions, process and thread management, commands, utilities, text editing, shell programming and text processing utilities.
Prerequisite: MIS 145 with grade "C" or better

MIS 251 - Networking I
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Introduction to voice and data networking concepts and technologies, including network types, common network standards, network interface cards, wired and wireless network components, IP addressing and sunbathing, network protocols, basic network security, and troubleshooting basic network issues.
Prerequisite: MIS 145 with grade "C" or better

MIS 255 - Health Informatics Cpts & Prct
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
The discipline of health informatics is introduced, including history, knowledge of health informatics, data management, vocabularies, standards and tools as applied in the support of health care delivery. The course provides foundation knowledge and understanding of the impact of information technology in the health care industry and vice versa. Particular attention is paid to the design, usage and acceptance of information technology applications. This course introduces students to the concepts and practices of health informatics.

MIS 273 - Systems Administration I
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Introduces the fundamental skills required to install and manage a Windows Server. Topics covered include installing and configuring Active Directory, domain controllers, DNS, users and group definition, print ques, network roles and services and application servers.
Prerequisite: MIS 145 with grade "C" or better

MIS 275 - Intro to Relational Databases
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
The relational model, DBMS functions, administration, design methodology, modeling and normalization. Hands-on design, development and use of an enterprise database system using SQL Server. SQL fundamentals will be introduced, covering select statements, data manipulation, sub-queries, multi-table queries, functions and data types.

MIS 280 - Web Development Fundamentals
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Introduces Hypertext Markup Language (HTML5) and Cascading Style Sheets (CSS) as the principle coding formats used in creating web pages. Students will learn code syntax, commenting, writing, testing, and maintenance of HTML and CSS. Also introduces basic dynamic web page development using simple JavaScript. Students will be able to create a multi-page web site using these technologies.
Prerequisite: MATH 100

MIS 285 - Python Programming
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Introduction to the fundamentals of programming with the Python programming language. Topics covered include basic data types, control structures, regular expressions, input/output, and textual analysis. Focus on creating simple programs and scripts.
Prerequisite: MATH 100

MIS 307 - Seminar
Lecture Hours: 12
Lab Hours: 0
Credit Hours: 12
(Hours to be arranged each term.)

MIS 311 - Intro to Systems Analysis
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Introduction to state-of-the-art business information systems. Acquiring, processing and distributing information in a technological environment. The MIS organization, its place in business, key trends and implications. Introduction to computer hardware. Introduction to System Development Life Cycle.
Prerequisite: WRI 121

MIS 312 - Systems Analysis I
Lecture Hours: 4
Lab Hours: 0
Credit Hours: 4
Planning and Analysis phases of Systems Development Life Cycle. Focuses on software development life cycles; entity relationships, data flow diagrams. prototyping and other forms of data or system modeling. Designing, selecting and installing new systems for end users. Includes cost/benefit and value added evaluations.
Prerequisites: CST 324 or MIS 275 and MIS 311

MIS 315 - Cmpter Software Techniqs
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Lectures are divided between data structures and operating systems. Data structures section involves data representation, B-trees, graphs, and files. Operating systems section involves process, memory, and file management as related to UNIX. Cannot be taken for graduation credit if student has completed CST 313.
Prerequisite: MIS 126 with grade "C" or better

MIS 318 - Advanced Programming in C#
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Introduction to advanced programming techniques using the C# programming language. Emphasis on the design and development of business applications.
Prerequisite: MIS 218 with grade "C" or better

MIS 322 - Systems Analysis II
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Design, implementation and maintenance phases of Systems Development Life Cycle. Designing, selecting and installing new systems for end users. Includes cost/benefit and value-added evaluations. Define and perform data modeling, process modeling, network modeling and their importance.
Prerequisites: MIS 218, MIS 312, and MIS 341, all with grade "C" or better

MIS 334 - Business Analytics
Lecture Hours: 4
Lab Hours: 0
Credit Hours: 4
Understanding of Descriptive, Predictive and Prescriptive Analytics. Regression, Forecasting, Simulation, Sampling and Optimization in relation to business application. Introduction to Data Mining Algorithms are also covered.
Prerequisites: MATH 361; and CST 324 or MIS 113 or MIS 275, all with grade "C" or better

MIS 341 - Relational Database Design I
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
A comprehensive study of SQL and TSQL using the SQL Server relational database management system. Hands-on training will include the use of TSQL, SQL Server Management Studio, database creation, CLR, data queries, view definitions and use

operators and functions, triggers, calculations, indexing, cursors and data manipulation.
Prerequisites: MIS 118 and MIS 275, both with grade "C" or better

MIS 343 - Relational Database Design III
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
Install, create, and maintain an Oracle database. Oracle database architecture and component interactions. Implement, configure, and monitor an operational database in an effective manner including performance monitoring, database security, user management, and backup/recovery techniques.
Prerequisite: MIS 342

MIS 344 - Business Intelligence
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
Develop analytic solutions to gain functional understanding of Business Intelligence to solve business problems. Covers the development of Crystal Reports and Dash-boarding tools to develop Reporting and interface solutions for business.
Prerequisite: MIS 341 with grade "C" or better

MIS 345 - Health Care Info Systms Mgment
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Information Systems within healthcare organizations are examined. Business, clinical, and healthcare delivery processes are identified as they relate to data acquisition and information systems. Key issues confronting design, organization and management of healthcare systems are identified, examined, and solutions are explored and developed.
Prerequisites: BUS 313 and BUS 317

MIS 351 – Enterprise Networking
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Covers intermediate- to advanced-level network design and implementation topics utilizing enterprise network technologies. Students will interface with enterprise services including virtual local area networks (VLANs), link aggregation, route redistribution, multi-layer switching, wide area network (WAN) connection types, multi-protocol label switching (MPLS), software-defined networking (SDN/SD-WAN), optics and transport, and network design with high availability.
Prerequisite: MIS 251 with grade "C" or better

MIS 357 - Info & Comm Systs in Hlth Care
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
Addresses the role of computer-based information and communications systems in patient care and health care administration, including hands-on experience with the acquisition, storage and use of information in the electronic medical record systems such as PACS, lab and pharmacy systems and computerized provider order entry (CPOE).
Prerequisite: MIS 255

MIS 365 - Cloud Computing
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Introduces the technologies and services that enable cloud computing, different types of cloud computing services (SaaS, PaaS, DaaS, and IaaS), deployment models (Public, Private, and Hybrid) and the security and legal issues associated with cloud computing.
Prerequisites: MIS 251 and MIS 273, both with grade "C" or better

MIS 375 - Decision Support Systems
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
Use of personal computer application programs for analysis and reporting, problem solving, and decision assistance.
Prerequisites: Junior standing, MATH 111, and MIS 102

MIS 385 - NoSQL
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
Develop concepts and a fundamental skill set of NoSQL and document-oriented data models. Students will gain a broader DBA techniques used in managing database systems through replication and shading approaches.
Prerequisite: MIS 341 with grade "C" or better

MIS 390 - Co-op Field Experience
Lecture Hours: 0
Lab Hours: 0
Credit Hours: 21
An approved work program related to the student's field of specialization for a continuous three-month or six-month period. The employer type, level, and difficulty of the particular job must be approved by the student's advisor prior to the employment period. A written comprehensive report of activities must be submitted during the following term of residence.
Prerequisites: All MIS 100 and 200 level courses

MIS 405 - Reading and Conference
Lecture Hours: 6
Lab Hours: 0
Credit Hours: 6
(Hours to be arranged each term.)

MIS 407 - Seminar
Lecture Hours: 13
Lab Hours: 0
Credit Hours: 13
(Hours to be arranged each term.)

MIS 408 - Workshop
Lecture Hours: 6
Lab Hours: 0
Credit Hours: 6
(Hours to be arranged each term.)

MIS 414 - Infor Systems Development
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
Review of systems analysis. Tools, techniques, and reference sources used to research, configure and justify the hardware, software, staff, and facilities required for a computer system. Changeover, file conversion and testing. Post-installation audit, backup, security and privacy.
Prerequisites: MIS 312 and a programming language

MIS 441 - Big Data
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Advanced application of data best practices. Evaluating the big data ecosystem and when big data systems are best utilized in comparison to relational data models. Develop an understanding of big data concepts, model design and implementation and sustainability through a big data platform. Emphasis will be on utilizing the big data platform to provide information to solve business problems.

MIS 442 - Adv Database App Programming
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Construct graphical end-user interfaces for scalable, high performance Internet applications. Building, testing, debugging and deploying interactive Internet applications that use an enterprise level Database Management System. Develops experience with the Systems Development Life Cycle (SDLC) for web/database integration for application development. Develop understand and application of Software as a Service (SaaS). For graduate credit, students will participate in a field placement project working with companies such as the BLM to create a working application demonstrating mastery of the subject material.
Prerequisites: MIS 218 and MIS 341, both with grade "C" or better

MIS 445 - Legal/Eth/Soc Iss in HC Tech
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Legal, ethical, and social issues in health care, especially as they impact system design, development, use and management will be examined.
Prerequisite: BUS 313

MIS 446 - Data Mining
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
Defining the project cycle of data mining through data collection, analysis and assessment. Classification, Clustering, Association, Regression, Forecasting, Sequence Analysis and Deviation Analysis are applied to the project life cycle of data mining applications.
Prerequisites: MIS 334 and MIS 344, both with grade "C" or better

MIS 451 - Networking III
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Focus on technologies and tools used in advanced enterprise networks. Includes project labs using network infrastructure to implement design goals and team projects.
Prerequisite: MIS 351 with grade "C" or better

MIS 490 - Co-op Field Experience
Lecture Hours: 0
Lab Hours: 0
Credit Hours: 21
An approved work program related to the student's field of specialization for a continuous three-month or six-month period. the employer type, level, and difficulty of the particular job must be approved by the student's advisor prior to the employment period. a written comprehensive report of activities must be submitted during the following term of residence.
Prerequisites: All MIS 100 and 200 level courses

MIS 495 - Senior Project Selection
Lecture Hours: 1
Lab Hours: 0
Credit Hours: 1
Selection of the senior project capstone project concept that meets industry demands and stakeholders requirement.
Prerequisite: MIS 312 and MGT 335 with grade "C" or better or instructor consent

MIS 496 - Senior Project Management
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
Focuses on project management. Includes best-known industry practices, as well as planning, organizing and managing resources to bring about successful completion of specific project goals and objectives. Produces formal proposal for Senior Project.
Prerequisites: MIS 322 and MIS 495, both with grade "C" or better, or instructor consent

MIS 497 - Senior Project II
Lecture Hours: 1
Lab Hours: 6
Credit Hours: 3
Senior project students will plan, develop, and carry through to completion a management information systems project for a client they select. Formal proposal, progress reports and project demonstration/presentation. The instructor serves as the student's consultant.
Prerequisite: MIS 496 with grade "C" or better

MIS 498 - Senior Project III
Lecture Hours: 1
Lab Hours: 6
Credit Hours: 3
Senior project students plan, develop, and complete a project for a client or an independent research project. Periodic progress reports and presentations required. Instructor functions as a consultant. Deliver final project.
Prerequisite: MIS 497 with grade "C" or better

MIS 542 - Adv Database App Programming
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Construct graphical end-user Interfaces for scalable, high performance Internet applications. Building, testing, debugging and deploying interactive Internet applications that use an enterprise level Database management System. Develops experience with the Systems Development Life Cycle (SDLC) for web/database integration for application development. Develop understand and application of Software as a Service (SaaS). For graduate credit, students will participate in a field placement project working with companies such as the BLM to create a working application demonstrating mastery of the subject material.
Prerequisites: MIS 218 and MIS 341, both with grade "C" or better

Medical Imaging Technology

MIT 103 - Intro to Med Imaging
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Orientation to the art and science of medical imaging. History and development of radiologic science, diagnostic medical sonography, vascular technology, nuclear medicine technology, medical ethics, health care industry, related professional organizations and regulatory agencies.

MIT 107 - Seminar
Lecture Hours: 6
Lab Hours: 0
Credit Hours: 6
(Hours to be arranged each term.)

MIT 205 - Medical Imaging Tech Practicum
Lecture Hours: 1
Lab Hours: 0
Credit Hours: 1
The MIT Lab Practicum is a remedial section designed for imaging learners who plan to retake a sophomore year programmatic course or are returning to a program after brief hiatus. To be successful in Medical Imaging it is necessary to review essential didactic information and clinical skills in preparation for advancing in that program. Curriculum for this course is customized to each learner's needs and will be outline in their objectives.
Prerequisite: Sophomore standing in a Medical Imaging program

MIT 207 - Seminar
Lecture Hours: 12
Lab Hours: 12
Credit Hours: 12
(Hours to be arranged each term.)

MIT 209 - PACS I: Intro to PACS
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
An introduction to Picture Archiving Communications System (PACS). PACS Workflow within the department and interdepartmentally, PARCA and CIIP certification, procurement, and PACS system administration.

MIT 219 - PACS II: Comm and Admin
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Study of policies and procedures for PACS. Observation of the healthcare organization and PACS role within the organization. Overview of PACS components, image acquisition viewing of images, and image archiving.

MIT 225 Patient Care in Sonography
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
Basic concepts of patient care, infection control procedures, transport of critically ill patients, and recognition of emergency situations. Sonographer’s responsibility to the patient, the patient’s family, and the sonography profession.
Prerequisite: MIT 103 with grade “C” or better

MIT 229 - PACS III: Tech Req & Imag Qual
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Overview of computer basics, technical

requirements, and Operating System basics. An introduction to HIPAA and PACS image quality.

MIT 231 - Sonographic Princ & Instru I
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Properties of sound waves, propagation and interaction of ultrasound in tissue, basic ultrasound instrumentation, static, and real-time ultrasound imaging principles and artifacts are covered. Laboratory includes demonstration of wave characteristics and introduction to basic instrumentation of real-time ultrasound imaging.
Prerequisite: PHY 217 with grade "C" or better

MIT 232 - Sonographic Princ & Instru II
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Advanced physical principles. Hemodynamics, Doppler physics, color imaging, and artifacts associated with them are covered. Digital signal and image processing and bio effects are also discussed. Laboratory develops instrumentation skills.
Prerequisite: MIT 231 with grade "C" or better

MIT 239 - PACS IV: Implem & Sys Mgmt
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Overview of implementing PACS. Starting from procurement to the Return of Investment (ROI). This will include the proposal, approval process, integration, a post install. Class will include the study of DICOM and HL7.

MIT 249 - PACS V: DICOM
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Study of the DICOM standard and how it allows for modalities to communicate inside and outside of a facility.

MIT 259 - PACS VI: PACS Security
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Overview of Information Technology, IHE, security, structured reporting and networking fundamentals.

MIT 305 - Medical Imaging Tech Practicum
Lecture Hours: 1
Lab Hours: 0
Credit Hours: 1
The MIT Lab Practicum is a remedial section designed for imaging learners who plan to retake a sophomore year programmatic course or are returning to a program after brief hiatus. To be successful in Medical Imaging it is necessary to review essential didactic information and clinical skills in preparation for advancing in that program. Curriculum for this course is customized to each learner's needs and will be outline in their objectives.
Prerequisite: Junior standing in a Medical Imaging program

MIT 307 - Seminar
Lecture Hours: 12
Lab Hours: 12
Credit Hours: 12
(Hours to be arranged each term.)

MIT 310 - Cadaver Imaging Problems
Lecture Hours: 2
Lab Hours: 0
Credit Hours: 2
Cadaver imaging is a group centered project that allows imaging students to advance their technical, professional, and leadership skills. The process of imaging a human cadaver presents unique opportunities to identify and solve an infinite variety of complex problems.
Prerequisite: Junior standing in MIT program

MIT 341 - Magnetic Resonance Imaging
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Physics and principles used in the production used in the production of magnetic resonance images and spectroscopy, including: safety issues, static and gradient magnetic fields, coils, resonance, frequencies, relaxation, and computer applications. Basic pulse sequences are examined in detail.
Prerequisites: BIO 335, and PHY 201 or PHY 217, all with grade "C" or better

MIT 342 - Mag. Resonance Imaging II
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Advanced principles used in the production of magnetic resonance images. MRI safety, coil function and selection, advanced pulse sequences, magnetic resonance angiography (MRA), motion control techniques, pathology, artifacts, functional magnetic resonance imaging (fMRI).
Prerequisite: MIT 341

MIT 356 - Computed Tomography II
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
CT patient care, radiation dose reduction, and adverse effects of contrast media. Sectional anatomy and pathology of the abdomen, pelvis, chest, head, and spine. Laboratory simulation of imaging protocols and scan post processing. Preparation for ARRT CT registry examination.
Prerequisite: NMT 355 or RDSC 355

MIT 365 - Mag. Resonance Imaging Review
Lecture Hours: 2
Lab Hours: 0
Credit Hours: 2
Review of MR principles of image production for practicing and training MR technologists who intend to sit for the American Registry of Radiologic Technologists MRI examination.
Prerequisite: MIT 341

MIT 405 - Medical Imaging Tech Practicum
Lecture Hours: 1
Lab Hours: 0
Credit Hours: 1
The MIT Lab Practicum is a remedial section designed for imaging learners who plan to retake a sophomore year programmatic course or are returning to a program after brief hiatus. To be successful in Medical Imaging it is necessary to review essential didactic information and clinical skills in preparation for advancing in that program. Curriculum for this course is customized to each learner's needs and will be outline in their objectives.
Prerequisite: Senior standing in a Medical Imaging program or working toward an advanced level certification

MIT 407 - Seminar
Lecture Hours: 0
Lab Hours: 0
Credit Hours: (Hours to be arranged each term.)
(Hours to be arranged each term.)

MIT 411 - Magnetic Resonance Externship
Lecture Hours: 0
Lab Hours: 13
Credit Hours: 5
This one-term (3-month) practicum is designed to develop the skills of the student in the special imaging modalities, i.e., computed tomography, magnetic resonance imaging, ultrasound, nuclear medicine and special radiographic procedures. The student is sent to an affiliated hospital that has the required special imaging equipment to give the hands-on experience to develop competency in each of three areas chosen by the student. The student will spend one month in each selected area.
Prerequisite: MIT 341 with grade "C" or better

Medical Laboratory Science

MLS 100 - Introduction to MLS
Lecture Hours: 1
Lab Hours: 3
Credit Hours: 2
Orientation to the theory and practice of all aspects of the Medical Laboratory Science profession. The history of Medical Laboratory Science, professional

organizations and career opportunities are discussed.

MLS 107 - Seminar
Lecture Hours: 15
Lab Hours: 15
Credit Hours: 15
(Hours to be arranged each term.)

MLS 207 - Seminar
Lecture Hours: 0
Lab Hours: 0
Credit Hours: 15
(Hours to be arranged each term.)

MLS 307 - Seminar
Lecture Hours: 15
Lab Hours: 0
Credit Hours: 15
(Hours to be arranged each term.)

MLS 407 - Seminar
Lecture Hours: 0
Lab Hours: 0
Credit Hours: 10
(Hours to be arranged each term.)

MLS 415 - Clinical Chemistry I
Lecture Hours: 5
Lab Hours: 3
Credit Hours: 6
Fundamentals of chemical analysis of body fluids. Laboratory practice in chemical formats, data evaluation, laboratory utilization, and quality control theory. Laboratory exercises linked to lectures: amino acids, proteins, carbohydrates, lipids, blood gases, enzymes, trace elements, electrochemistry, osmometry, electrophoresis, and spectroscopy.

MLS 416 - Clinical Chemistry II
Lecture Hours: 5
Lab Hours: 3
Credit Hours: 6
Fundamentals of chemical analysis of body fluids. Laboratory practice in chemical formats, data evaluation, laboratory utilization, and quality control theory. Laboratory exercises linked to lectures: renal and liver function, porphyrins, hormones, pregnancy, fetal development, bone metabolism, nutrition, and geriatrics.
Prerequisite: MLS 415

MLS 417 - Clinical Chemistry III
Lecture Hours: 2
Lab Hours: 0
Credit Hours: 2
The theory, practical application and technical performance of chemical analysis. Emphasis on theory of therapeutic drug monitoring, toxicology, proteomics, individualized screening, and method validation.
Corequisite: MLS 416

MLS 420 - Clinic Immun & Infect Serology
Lecture Hours: 4
Lab Hours: 3
Credit Hours: 5
Lecture/laboratory coverage of human immunity, including innate and adaptive immunity, immune system organs, tissues, and activation. Immunological methods used in the clinical lab to assess human immune response in health and in various disease states are studied.

MLS 422 - Molecular Diagnostic Methods
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
Coverage of molecular techniques used in the clinical laboratory to diagnose disease. Topics covered include principles of molecular biology, nucleic acid isolation, purification, amplification, quantitation, and discrimination. Specimen collection/handling, ethical issues and molecular lab operations are also covered.

MLS 424 - Hemostasis
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
Lecture and laboratory coverage of the mechanisms of hemostasis and basic pathophysiology of hemostatic disorders. Student perform laboratory procedures pertaining to hemostasis, interpret results and correlate with other laboratory data to identify disease states.

MLS 432 - Foundations of MLS I
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
The first of three courses covering essential professional practice issues. Subjects covered include: quality control/quality assurance, laboratory safety, laboratory mathematics, ethics, educational methods and phlebotomy.

MLS 442 - Hematology I
Lecture Hours: 4
Lab Hours: 6
Credit Hours: 6
Lecture and lab coverage of normal development and function of blood cells. Students learn to evaluate normal and abnormal blood cell morphology through microscopic examination of blood smears. Students perform laboratory procedures pertaining to hematology.

MLS 443 - Immunohematology I
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Lecture and lab coverage of immunohematology with practical application in the contemporary blood bank laboratory. Topics covered include blood groups biochemistry, genetics, and immunology, test methods and transfusion practices including donor selection, component preparation, quality management and compliance issues.
Prerequisite: MLS 420

MLS 444 - Microbiology I
Lecture Hours: 4
Lab Hours: 6
Credit Hours: 6
Lecture/lab coverage of human bacterial pathogens seen in the clinical laboratory including gram positive and gram negative bacilli. Principles and methods of clinical microbiology laboratory diagnosis of bacterial diseases are studied.

MLS 445 - Microbiology II
Lecture Hours: 2
Lab Hours: 6
Credit Hours: 4
Lecture/lab coverage of diseases caused by, and clinical laboratory identification of, human microbial organisms including anaerobes, spirochetes, mycobacteria, chlamydia, and rickettsia. Interpretation of clinical specimens, identification of pathogens, and the recognition of normal flora is also studied.
Prerequisite: MLS 444

MLS 449 - Principles of Urinalysis
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
Lecture and laboratory coverage of renal function, urine formation, and methods used to analyze urine in the medical laboratory. Students perform physical, chemical, and microscopic analyses on clinical samples and correlate results with states of health and disease in man.

MLS 452 - Hematology II
Lecture Hours: 4
Lab Hours: 3
Credit Hours: 5
Comprehensive study of the pathophysiology of hematological disorders. Students perform microscopic examination of blood films, interpret results and correlate with other laboratory data to identify disease states.
Prerequisite: MLS 442

MLS 453 - Immunohematology II
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
Continued study of immunohematology emphasizing clinical decision-making and problem-solving related to blood banking and transfusion therapy practices.
Prerequisite: MLS 443

MLS 462 - Foundations of MLS II
Lecture Hours: 1
Lab Hours: 3
Credit Hours: 2
The second of three courses covering essential professional practice issues. Subjects covered include: educational methods, clinical laboratory management, research and a comprehensive simulated laboratory experience.
Prerequisite: MLS 432

MLS 463 - Foundations of MLS III
Lecture Hours: 0
Lab Hours: 3
Credit Hours: 1
Third of three courses covering essential professional practice issues. Emphasis on practical experience through the application of theories and concepts of professional development, laboratory operations and supervision at an approved off campus clinical site.
Prerequisites: MLS 432, MLS 462

MLS 464 - Med Mycology & Virology
Lecture Hours: 1
Lab Hours: 3
Credit Hours: 2
Lecture and laboratory coverage of pathogenic fungal and viral organisms with emphasis on those seen in a clinical laboratory. Principles and methods of clinical laboratory diagnosis of infections and diseases caused by these organisms are studied.

MLS 470 - Chemistry & Immunology Extern
Lecture Hours: 0
Lab Hours: 12
Credit Hours: 4
Four weeks full-time practical experience at an approved off-campus clinical site emphasizing application of knowledge and skills to perform a wide variety of testing in a contemporary clinical chemistry/immunology laboratory and further develop discipline-specific competency.
Prerequisite: Successful completion of all didactic, pre-clinical coursework in the MLS program

MLS 471 - Hematology Externship
Lecture Hours: 0
Lab Hours: 12
Credit Hours: 4
Four weeks full-time practical experience at an approved off campus clinical site emphasizing application of knowledge and skills to perform a wide variety of testing in a contemporary clinical hematology laboratory and further develop discipline-specific competency.
Prerequisite: Successful completion of all didactic, pre-clinical coursework in the MLS program

MLS 472 - Microbiology Externship
Lecture Hours: 0
Lab Hours: 12
Credit Hours: 4
Four weeks full-time practical experience at an approved off-campus clinical site emphasizing application of knowledge and skills to perform a wide variety of testing in a contemporary clinical Microbiology laboratory and further develop discipline-specific competency.
Prerequisite: Successful completion of all didactic, pre-clinical coursework in the MLS program

MLS 473 - Immunohematology Extern
Lecture Hours: 0
Lab Hours: 9
Credit Hours: 3
Practical experience at an approved off-campus clinical site emphasizing application of knowledge and skills to perform a wide variety of testing in a contemporary blood bank laboratory and further develop discipline-specific bank laboratory and further develop discipline-specific competency.
Prerequisite: Successful completion of all didactic, pre-clinical coursework in the MLS program

MLS 474 - Medical Parasitology
Lecture Hours: 1
Lab Hours: 3
Credit Hours: 2
Lecture and laboratory coverage of normal and pathogenic parasitic organisms of humans with emphasis on organisms seen in a clinical laboratory. Principles and methods of clinical laboratory diagnosis of infections and diseases caused by these organisms are studied.
Prerequisite: Admission to the MLS program

Music

MUS 107 - Seminar
Lecture Hours: 0
Lab Hours: 0
Credit Hours: 15
(Hours to be arranged each term.)

MUS 195 - Band
Lecture Hours: 0
Lab Hours: 3
Credit Hours: 1
One hour each term.

MUS 197 - Chorus
Lecture Hours: 0
Lab Hours: 3
Credit Hours: 1
One hour each term.

MUS 207 - Seminar
Lecture Hours: 6
Lab Hours: 0
Credit Hours: 6
(Hours to be arranged each term.)

MUS 307 - Seminar
Lecture Hours: 0
Lab Hours: 0
Credit Hours: 15
(Hours to be arranged each term.)

MUS 407 - Seminar
Lecture Hours: 6
Lab Hours: 0
Credit Hours: 6
(Hours to be arranged each term.)

Nuclear Medicine Technology

NMT 107 - Seminar
Lecture Hours: 0
Lab Hours: 0
Credit Hours: 15
(Hours to be arranged each term.)

NMT 205 - Nuclear Med Admin
Lecture Hours: 2
Lab Hours: 0
Credit Hours: 2
Orientation to the principles of management, marketing nuclear medicine services, and administrative procedures.
Prerequisite: MIT 103 with grade "C" or better

NMT 207 - Seminar
Lecture Hours: 0
Lab Hours: 0
Credit Hours: 12
(Hours to be arranged each term.)

NMT 212 - Nuc Med Phy/Radiation Biophy
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Interactions of radiation with matter. Introduction to the cellular and systemic responses to radiation. Early and late somatic and genetic effects described. Critical organ dose calculations risks versus benefits. Overview of film processors, associated chemistry.

NMT 215 - Radiochem/Radiopharmacy
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
The design and function of radionuclide generators, labeling procedures, sterility and pyrogenicity considerations, radionuclide and radiochemical quality control procedures.
Prerequisite: CHE 350 with grade "C" or better

NMT 217 - Patient Care
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Basic concepts of patient care, including consideration of physical and psychological needs of the patient and family. Routine and emergency patient care procedures. Infection control procedures utilizing Universal Precautions. Role of the nuclear medicine technologist in patient education.
Prerequisite: MIT 103

NMT 225 - Nuclear Phy/Instrumtn
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
An in-depth examination of the physics in nuclear medicine, principles of detection, considerations of counting and imaging, collimators, planar imaging and associated

quality assurance and control. Use of all major instrumentation in nuclear medicine departments.
Prerequisite: NMT 215 with grade "C" or better

NMT 256 - Cardiovascular Imaging
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Introduction to Cardiovascular Imagining techniques in Nuclear Medicine including planar, SPECT, and PET imaging acquisition and processing protocols, radiopharmaceuticals, cardiac anatomy and physiology, exercise and pharmacological stress testing, and EKG principles.
Prerequisites: NMT 205, NMT 215, and NMT 217

NMT 307 - Seminar
Lecture Hours: 12
Lab Hours: 0
Credit Hours: 12
(Hours to be arranged each term.)

NMT 311 - Imaging Procedures I
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Proper patient care before, during, and after the procedure, identification and administration of prescribed radio pharmaceuticals. The use of imaging devices and external detectors for body organ imaging.
Prerequisite: NMT 225 with grade "C" or better

NMT 312 - Imaging Procedures II
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Proper patient care before, during and after the procedure, identification and administration of prescribed radio pharmaceuticals. The use of imaging devices and external detectors for body organ imaging.
Prerequisite: NMT 225 with grade "C" or better

NMT 313 - Therapeutic Procedures
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Common Therapeutic applications of radionuclides, dose ranges for each application, and proper techniques for calculating quantities of administered radiopharmaceuticals. Includes patient care, follow-up procedures and disposal of excreta.
Prerequisite: NMT 312 with grade "C" or better

NMT 315 - Breast Imaging
Lecture Hours: 1
Lab Hours: 0
Credit Hours: 1
An in-depth analysis of breast anatomy and physiology, positioning, and interventional methods. Patient education and breast cancer statics will also be discussed at great lengths.
Prerequisite: Junior standing in Nuclear Medicine

NMT 325 - SPECT Imaging/Comp Appl
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Single photon emission computed tomography (SPECT) imaging and computer applications as applied to nuclear medicine imaging. Demonstration of computer techniques and ECG monitoring and interpretation. Theoretic basis of computer operations and medical applications in nuclear medicine. Lab experience with computerized systems, including hospital sites.
Prerequisites: BIO 335 and NMT 312, both with grade "C" or better

NMT 355 - Computed Tomography
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
X-ray physics, scanner components, and data acquisition of computed tomography. Image reconstruction, manipulation, and artifacts. CT patient care and imaging procedures of the head, neck, spine, chest, abdomen, pelvis and musculoskeletal system. Laboratory simulator practice on image manipulation, scan post processing and reconstruction.
Prerequisite: NMT 311 with grade "C" or better
Corequisites: BIO 335 and NMT 367

NMT 367 - PET Imaging
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Introduction to Position Emission Tomography (PET) imaging techniques including acquisition protocols, processing protocols, quality control procedures, radiation protection, patient screening, radiopharmaceuticals, image fusion, and imaging procedures.
Prerequisite: NMT 225 with grade "C" or better
Corequisites: NMT 311 and NMT 346

NMT 388 - Externship Preparation
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Review and summarize key concepts in Nuclear Medicine. Focus is on patient care and interpersonal scenarios the externship student will likely face while in the hospital environment. Review and discussion of the NMT Externship Handbook and Procedures Log.
Prerequisite: Third quarter Junior standing

NMT 407 - Seminar
Lecture Hours: 0
Lab Hours: 0
Credit Hours: 12
(Hours to be arranged each term.)

NMT 410 - Nuclear Med Tech Extern
Lecture Hours: 0
Lab Hours: 0
Credit Hours: 15
All students must complete four consecutive terms (12 months) of clinical experience in nuclear medicine technology at an OIT approved site. Students will work under the direct supervision of a registered Nuclear Medicine Technologist.
Prerequisite: All NMT courses with grade "C" or better

NMT 445 - Computed Tomography Clinical
Lecture Hours: 0
Lab Hours: 15
Credit Hours: 5
All students must complete (3) consecutive terms (9 months) of clinical experience in computed tomography at a hospital or clinic of their choosing. Students will work under the direct supervision of an ARRT (CT) board registered technologist.
Prerequisites: ARRT and/or NMTCB registry in Nuclear Medicine Technology. Successful completion and faculty approval of Computed Tomography and Cross Sectional anatomy course.

Physical Education

PHED 100 - Belly Dance: Beginning
Lecture Hours: 0
Lab Hours: 3
Credit Hours: 1
Experience an unique dance form. Students will learn basic hip, rib, and shoulder isolations and of course shimmies. All of this and more are done in combinations, and finally a choreographed dance.

PHED 101 - Belly Dance: Intermediate
Lecture Hours: 0
Lab Hours: 3
Credit Hours: 1
A continuation of the beginning class. More complex moves are introduced and more technical expertise is expected. Dancing with veils will be introduced. There will be more complex choreography and music. Dance experience is helpful.

PHED 102 - Zumba
Lecture Hours: 0
Lab Hours: 3
Credit Hours: 1
Zumba is an exhilarating, effective, easy to follow, Latin inspired, calorie burning dance fitness party. Zumba classes feature exotic rhythms set to high energy Latin and international beats.

PHED 107 - Seminar
Lecture Hours: 4
Lab Hours: 0
Credit Hours: 4
(Hours to be arranged each term.)

PHED 110 - Boot Camp/Kick Boxing
Lecture Hours: 0
Lab Hours: 3
Credit Hours: 1
This is a high-low workout with an emphasis on kickboxing (both Taebo and Turbo kickboxing), also included is body pump workouts, core ball as well as Winsor Pilates stretching.

PHED 111 - Core Strength and Balance
Lecture Hours: 0
Lab Hours: 3
Credit Hours: 1
BOSU ball training to improve balance and core strength and alleviate back pain and instability. This class includes full body training, using floor work, cardio circuits, and isometric exercises.

PHED 112 - Intro to Cardio and Core
Lecture Hours: 0
Lab Hours: 3
Credit Hours: 1
A survey participation of cardiovascular group exercise using cardio kickboxing (including both Taebo and Turbo kickboxing), dance aerobics, and step aerobics.

PHED 113 - Super Circuit/Cardio Training
Lecture Hours: 0
Lab Hours: 3
Credit Hours: 1
This course is designed to use a combination of free weights and/or the universal machines, along with cardiovascular fitness to provide a comprehensive program to increase muscle strength and endurance.

PHED 120 - Pilates and Body Pump
Lecture Hours: 0
Lab Hours: 3
Credit Hours: 1
Focus is the floor techniques developed by Joseph Pilates as well as ball Pilates/core strength training. Use of a core ball and body pump bar for anaerobic workout and tone.

PHED 121 - Total Fitness Conditioning I
Lecture Hours: 0
Lab Hours: 3
Credit Hours: 1
Opportunity to do an independent study of a selected aspect of physical education. Class designed to develop and encourage healthy attitudes and habits with regard to cardiovascular efficiency, body composition, muscular strength and endurance, and flexibility.

PHED 122 - Total Fitness Conditioning II
Lecture Hours: 0
Lab Hours: 3
Credit Hours: 1
Opportunity to do an independent study of a selected aspect of physical education. Class designed to develop and encourage healthy attitudes and habits with regard to body composition, muscular strength and endurance. Geared toward weight training workouts.

PHED 123 - Dancercise/Step Aerobics
Lecture Hours: 0
Lab Hours: 3
Credit Hours: 1
A combination of step aerobics and dance moves to provide a fat burning/cardiovascular workout.

PHED 124 - Weight Loss
Lecture Hours: 0
Lab Hours: 3
Credit Hours: 1
Introduction to weight loss and the wellness model. Develop a fitness program for basic nutrition and weight control. Lecture portion spent in the field and in the weight room/cardio room learning techniques and skills related to weight control.

PHED 125 - Weight Management Fitness
Lecture Hours: 0
Lab Hours: 3
Credit Hours: 1
Continuation of the Weight Loss class. Made to reinforce commitment to fitness for participants. Includes 40-45 minutes cardio, 15 minutes of intense cardiovascular training and 20-30 minutes low cardiovascular training. No lecture on weight loss with this class.

PHED 126 - Body Pump & Core Ball Pilates
Lecture Hours: 0
Lab Hours: 3
Credit Hours: 1
A strength and endurance training workout involving intermittent cycles of cardio and weight training. Workouts intended to increase a person's metabolic rate as well as anaerobic fitness level.

PHED 130 - Rowing
Lecture Hours: 0
Lab Hours: 3
Credit Hours: 1
Learn the fundamentals of rowing in a multi-person racing shell with racing oars and sliding seats. Also covered will be rowing and race terminology, marine safety, and improving fitness. Good swimming skills required.

PHED 131 - Scuba: Beginning
Lecture Hours: 1
Lab Hours: 3
Credit Hours: 2
Entry-level course. 1-hour lecture and 2 pool sessions per week. Post-course students are eligible for NAUI certification dives. Consists of 5 dives over two day period off-campus. No additional charge.
Prerequisite: Must pass swim test

PHED 132 - Scuba: Advanced
Lecture Hours: 1
Lab Hours: 3
Credit Hours: 2
Learn diving in challenging environments. Six dives include night, navigation, and deep dives and three others (your choice). Dives on weekend's off-campus. Dive gear furnished. Included is certificate to dive Oxygen enriched mixtures (Nitrox).
Prerequisite: PHED 131

PHED 141 - Tai Chi for Circulation
Lecture Hours: 0
Lab Hours: 3
Credit Hours: 1
Learn ancient Chinese techniques to reduce stress, improve balance, and facilitate health. Practice includes various forms utilizing acupressure points and energy meridians that additionally will help facilitate health of heart and lungs, normalize blood pressure, and control blood sugar.

PHED 142 - Tai Chi for Internal Organs
Lecture Hours: 0
Lab Hours: 3
Credit Hours: 1
Learn ancient Chinese techniques to reduce stress, improve balance, and facilitate health. In a relaxed atmosphere, practice of various forms will additionally utilize acupressure points and energy meridians to facilitate health of internal organs.

PHED 143 - Tai Chi & Qigong: Hlth, Bns, Mu
Lecture Hours: 0
Lab Hours: 3
Credit Hours: 1
Learn ancient Chinese techniques to reduce stress, improve balance, and facilitate health. In a relaxed atmosphere, practice of various forms that additionally will help maintain bone density, ward of arthritis, maximize joint flexibility, and strengthen muscles supporting joints.

PHED 144 - Tai Chi & Qigong: Neck/Back St
Lecture Hours: 0
Lab Hours: 3
Credit Hours: 1
Learn ancient Chinese techniques to reduce stress, improve balance, and facilitate health. In a relaxed atmosphere, practice of various forms that additionally will strengthen neck and back, and help to prevent injury or heal from previous injuries.

PHED 145 - Relaxation and Flexibility
Lecture Hours: 0
Lab Hours: 3
Credit Hours: 1
Explore Tai Chi and Qigong methods for stress reduction and facilitation of balance and flexibility. Other stress reduction methods include autogenic training, progressive muscle relaxation, and self-hypnosis. Explore the impact of cardiorespiratory exercise and diet on stress management.

PHED 146 - Yoga
Lecture Hours: 0
Lab Hours: 3
Credit Hours: 1
Class is generally Hatha Yoga, along with basic Ashitanga, and Kundalini Yoga techniques. In yoga, a participant can hope to improve their flexibility, strength and balance.

PHED 150 - Aikido
Lecture Hours: 0
Lab Hours: 3
Credit Hours: 1
A Japanese martial art reflecting the circular movements and energy transference found throughout the universe. Provides the necessary skills to train for practical and tough self-defense while building self-confidence, character, self-respect, and respect for others.

PHED 151 - Karate
Lecture Hours: 0
Lab Hours: 3
Credit Hours: 1
Dive into the very heart and soul of Karate! Teachings in traditional forms, self-defense, and competitive style point sparring. Great for new and experienced students. Promotes physical activity, increased mobility, and awareness while learning a valuable life skill.

PHED 160 - Cross Country Skiing: Begin
Lecture Hours: 0
Lab Hours: 3
Credit Hours: 1
Explore clothing, equipment and learn to travel on cross country skis while avoiding winter hazards. Learn basic map and compass skills to avoid getting lost. Two field trips provide experience to use for a lifetime.

PHED 161 - Snowshoeing: Beginning
Lecture Hours: 0
Lab Hours: 3
Credit Hours: 1
Explore clothing, equipment and learn to snowshoe while avoiding winter hazards. Learn basic map and compass skills to avoid getting lost. Two field trips provide an enjoyable and learning recreational experience to use for a lifetime.

PHED 162 - Ice Skating
Lecture Hours: 0
Lab Hours: 3
Credit Hours: 1
Covers basic figure skating technique using U.S. Figure Skating adult teaching guidelines, levels 1 through 4. Skills include proper use of forward and backward edges, basic curves and turns, simple spins and integrated use of upper body and arm movements.

PHED 163 - Wilderness Navigation
Lecture Hours: 0
Lab Hours: 3
Credit Hours: 1
Learn to read a map and utilize a compass. Gain skill to find precise wilderness locations. Learn the dangers of wilderness travel, and deal with those situations. Two field trips polish skills using map and compass to navigate.

PHED 170 - Golf
Lecture Hours: 0
Lab Hours: 3
Credit Hours: 1
Lecture covers terminology, rules and etiquette. Practical covers driving, chipping and putting. Also includes 1 nine hole round per week (10 total). Collared shirt required.

PHED 171 - Archery: Beginning
Lecture Hours: 0
Lab Hours: 3
Credit Hours: 1
Students learn basics of shooting a bow & arrow. Safety, form, mechanics, and practical basic skills. Classes meet off-campus. No prior experience required.

PHED 172 - Archery: Intermediate
Lecture Hours: 0
Lab Hours: 3
Credit Hours: 1
Build upon basic skills learned in Beginning Archery. Advanced instruction in shooting, mechanics, and basic repairs offered. Classes meet off-campus.
Prerequisite: PHED 171

PHED 174 - Recreational Basketball
Lecture Hours: 0
Lab Hours: 3
Credit Hours: 1
Basketball game played in a recreational environment. Emphasis on free play and team skill development. Most suitable for players with basic basketball skills.

PHED 175 - Rugby
Lecture Hours: 0
Lab Hours: 3
Credit Hours: 1
Basic rugby skill, practice, and game play. Players of any skill level welcome. Participants should be able to engage in physical contact, strength development, endurance training, team practice, and game play.

PHED 180 - Varsity Cross Country
Lecture Hours: 0
Lab Hours: 3
Credit Hours: 1
Competitive Cross Country for multi-level distance runners. Trail running, conditioning, strength training, psychological peak performance, nutrition, race tactics, running physiology and injury prevention is included. Participation in intercollegiate competition is included. Varsity athletes only or coach’s approval.

PHED 181 - Varsity Soccer
Lecture Hours: 0
Lab Hours: 3
Credit Hours: 1
Competitive Soccer at the intercollegiate level, including coaching strategies, offensive and defensive strategies, training, conditioning and team organization. Varsity athletes only or coach's approval.

PHED 182 - Varsity Track/Field
Lecture Hours: 0
Lab Hours: 3
Credit Hours: 1
Competitive Track and Field techniques are covered including training, conditioning and team organization. Competition at the intercollegiate level. Varsity athletes only or coach's approval.

PHED 183 - Varsity Men's Baseball
Lecture Hours: 0
Lab Hours: 3
Credit Hours: 1
Competitive Baseball on the intercollegiate level, including coaching strategies, offensive and defensive strategies, training, conditioning and team organization. Varsity athletes only or coach's approval.

PHED 184 - Varsity Men's Basketball
Lecture Hours: 0
Lab Hours: 3
Credit Hours: 1
Competitive Basketball, including coaching strategies, offensive and defensive strategies, training, conditioning and team organization, including intercollegiate competition. Varsity athletes only or coach's approval.

PHED 185 - Varsity Women's Basketball
Lecture Hours: 0
Lab Hours: 3
Credit Hours: 1
Competitive Basketball, including coaching strategies, offensive and defensive strategies, training, conditioning and team organization, including intercollegiate competition. Varsity athletes only or coach's approval.

PHED 186 - Varsity Women's Softball
Lecture Hours: 0
Lab Hours: 3
Credit Hours: 1
Competitive Softball including coaching strategies, offensive and defensive strategies, training, conditioning and team organization, including intercollegiate competition. Varsity athletes only or coach's approval.

PHED 187 - Varsity Women's Volleyball
Lecture Hours: 0
Lab Hours: 3
Credit Hours: 1
Competitive Volleyball at the intercollegiate level including advanced technique analysis, offensive and defensive strategies, training, conditioning, and team organization. Varsity athletes only or coach's approval.

PHED 188 - Varsity Sport/Strength Cond
Lecture Hours: 0
Lab Hours: 3

Credit Hours: 1
This course provides instruction for sports specific conditioning for varsity athletes. This includes strength training, power training, speed and agility training, core training, dynamic flexibility, and specific energy system training. Varsity athletes only or instructor consent.

PHED 189 - Varsity Golf
Lecture Hours: 0
Lab Hours: 3
Credit Hours: 1
Competitive golf techniques are covered including training, conditioning, team organization advanced technique analysis. Competition at the intercollegiate level. Varsity athletes only or coach's approval.

PHED 190 - Physical Education
Lecture Hours: 0
Lab Hours: 3
Credit Hours: 1
Service course. General participation in physical activities to promote sound health.

PHED 201 - Sports Seminar: Officiating
Lecture Hours: 1
Lab Hours: 3
Credit Hours: 2
This course includes rules, mechanics and officiating procedures in sports found in intercollegiate, interscholastic, and intramural programs. Practical experience in officiating will be provided.

PHED 207 - Major Sports Seminar
Lecture Hours: 1
Lab Hours: 2
Credit Hours: 2
Development of professional competencies in fundamentals of training methods and objectives of major sports. Development of professional competencies in fundamentals of training methods and objectives of major sports.

PHED 255 - Intro to Coaching Theory
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
An introduction to the central principles of coaching. Exploration of coaching as a practice including theories of coaching, motivation, and organization.

PHED 291 - Lifeguard Training
Lecture Hours: 1
Lab Hours: 2
Credit Hours: 2
Basic skills of lifesaving in aquatic programs; American Red Cross Advanced Lifesaving Authorization.

PHED 292 - Water Safety Instructor
Lecture Hours: 1
Lab Hours: 2
Credit Hours: 2
Analysis, methods of instruction, and teaching of aquatic skills; American Red Cross Authorization in Water Safety Instruction.

PHED 307 - Seminar
Lecture Hours: 0
Lab Hours: 0
Credit Hours: 15
(Hours to be arranged each term.)

PHED 355 - Coaching in Application
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Application of the principles of coaching. Application of the theories of coaching across contexts and in various different sports.
Prerequisite: PHED 255

PHED 407 - Seminar
Lecture Hours: 0
Lab Hours: 0
Credit Hours: 15
(Hours to be arranged each term.)

PHED 455 - Coaching Practicum
Lecture Hours: 0
Lab Hours: 6
Credit Hours: 3
Practical application of coaching theories and methods in context. 60 hours of directed coaching experience.
Prerequisite: PHED 355

Philosophy

PHIL 105 - Introduction to Ethics
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Students will become familiar with Kant's moral theory and Utilitarianism and use them to examine the morality of abortion, factory farming, and famine relief, among others. Students will learn how to make rational moral judgments.
Prerequisite: WRI 122 or WRI 227

PHIL 107 - Seminar
Lecture Hours: 0
Lab Hours: 0
Credit Hours: 15
(Hours to be arranged each term.)

PHIL 205 - Introduction to Logic
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
This course prepares students to critique and assess arguments according to the rules of logic. Students will learn formal and informal methods for assessing deductive, inductive, abductive arguments. Logic is useful for all majors because everything you learn at OIT is based on arguments.

PHIL 207 - Seminar
Lecture Hours: 6
Lab Hours: 0
Credit Hours: 6
(Hours to be arranged each term.)

PHIL 215 - Ethical Theory
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Students will become familiar with some plausible moral theories: Kant's moral theory, Aristotle's moral theory, Utilitarianism, The Social Contract, Feminist Ethics and with some more controversial moral theories: Cultural Relativism, Divine Command Theory, Natural Law Theory, Emotivism.
Prerequisite: WRI 122 or WRI 227

PHIL 305 - Medical Ethics
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Students will become familiar with Kant's moral theory and Utilitarianism and use them to examine the morality of abortion, paternalism, allocation of medical resources, and the right to die, among others. Students will learn how to make rational moral judgments.
Prerequisites: WRI 122 and Junior standing

PHIL 307 - Seminar
Lecture Hours: 0
Lab Hours: 0
Credit Hours: 15
(Hours to be arranged each term.)

PHIL 315 - The Ethics of Emerging Tech
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
In this course we will become familiar with genetic engineering, geoengineering and cognitive enhancement and examine the moral status of each. This course will provide you with the critical thinking skills to make rational ethical decisions concerning emerging technologies.
Prerequisite: WRI 122 or WRI 227

PHIL 325 - Environmental Ethics
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Students will become familiar with influential moral theories, including those of Kant and Aristotle and Utilitarianism. Possible topics include: What is nature? Do we have a moral obligation to restore ecosystems? If we have moral obligations to nature, on what grounds?
Prerequisite: WRI 122 or WRI 227

PHIL 331 - Ethics in the Professions
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Applied ethics course that focuses on examining ethical issues common to the professions, such as privacy, confidentiality, social responsibility, and whistleblowing. Emphasizes critical thinking and ethical decision-making skills.
Prerequisite: WRI 123 or WRI 227

PHIL 335 - Philosophy of Science
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3

What is the difference between science and pseudoscience? What is a scientific explanation? What is a law of nature? Is science objective of value-laden? In this course, students will engage with these and other fundamental topics in philosophy of science.
Prerequisite: WRI 122 or WRI 227

PHIL 342 - Business Ethics
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Business ethics course that focuses on ethical issues commonly found in business, such as whistle-blowing, discrimination, finance, and international manufacturing. Emphasizes critical thinking, critical reading, and the importance of personal ethics.
Prerequisites: One previous Humanities course and WRI 122

PHIL 405 - Advanced Logic
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
This course will build off the foundation of PHIL 205. Students will deepen their understanding of sentential logic and will learn about predicate logic. We will also prove that both formal systems are sound and complete.
Prerequisite: PHIL 205

PHIL 407 - Seminar
Lecture Hours: 6
Lab Hours: 0
Credit Hours: 6
(Hours to be arranged each term.)

Physics

PHY 107 - Seminar
Lecture Hours: 0
Lab Hours: 0
Credit Hours: 15
(Hours to be arranged each term.)

PHY 201 - General Physics
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
An introduction to physics with study of Newtonian mechanics, including kinematics, dynamics, work, energy, power and hydraulics. All general physics students must register for a laboratory section.
Prerequisite: MATH 112 with grade "C" or better

PHY 202 - General Physics
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Temperature systems, heat, kinetic theory of gasses, introductory thermodynamics, and the fundamentals of electricity and magnetism. All general physics students must register for a laboratory section.
Prerequisite: PHY 201

PHY 203 - General Physics
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Wave motion, sound, introduction to geometrical and physical optics, and topics from modern physics. All general physics students must register for a laboratory section.
Prerequisite: PHY 202

PHY 207 - Seminar
Lecture Hours: 6
Lab Hours: 0
Credit Hours: 6
(Hours to be arranged each term.)

PHY 215 - Topics in Astronomy
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
Astronomy including a survey of the solar system, constellations, star characteristics, star groupings, galactic and extragalactic objects, stellar evolution, and instrumentation with emphasis on topics of maximum interest to the students.
Prerequisite: MATH 111

PHY 217 - Physics of Med Imaging
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
An introduction to physics for MIT majors. Topics include: basic mechanics, basic electrostatics, fundamentals of electronics, magnetism, sources and types of radiation, and image formation.
Prerequisite: MATH 112 with grade "C" or better

PHY 221 - General Physics w/Calculus
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Basic principles of physics with emphasis on applications of calculus. Newtonian mechanics, including kinematics, dynamics, work, energy, power, and hydraulics. All general physics students must register for a laboratory section.
Prerequisite: MATH 251 with grade "C" or better
Corequisite: MATH 252

PHY 222 - General Physics w/Calculus
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Temperature systems, heat, kinetic theory of gasses, thermodynamics and the fundamentals of electricity and magnetism. All general physics students must register for a laboratory section.
Prerequisites: MATH 252 and PHY 221

PHY 223 - General Physics w/Calculus
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Wave motion, sound, introduction to geometrical and physical optics, and selected topics from modern physics. All general physics students must register for a laboratory section.
Prerequisite: PHY 222, or PHY 221 and MATH 254 and instructor consent

PHY 305 - Nanoscience & Nanotech
Lecture Hours: 5
Lab Hours: 0
Credit Hours: 4
Survey of chemical and physical phenomena as applied to nanoscale materials, including metal and semiconductor nanoparticles and carbon nanostructures. Discussion of major synthesis and characterization techniques. Biological and engineering applications of nanoscale materials.
Prerequisites: PHY 222 or PHY 223, and CHE 202 or CHE 222

PHY 307 - Seminar
Lecture Hours: 6
Lab Hours: 0
Credit Hours: 6
(Hours to be arranged each term.)

PHY 311 - Intro to Modern Physics
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
An introduction to physics of the 20th century, including selected topics from atomic and nuclear physics and quantum theory with applications in science and industry.
Prerequisite: PHY 203 or PHY 223

PHY 312 - Intro to Modern Physics
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
An introduction to physics of the 20th century, including selected topics from atomic and nuclear physics and quantum theory with applications in science and industry.
Prerequisite: PHY 203 or PHY 223

PHY 313 - Intro to Modern Physics
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
An introduction to physics of the 20th century, including selected topics from atomic and nuclear physics and quantum theory with applications in science and industry.
Prerequisite: PHY 203 or PHY 223

PHY 330 - Electricity & Magnetism
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
A study of electromagnetic phenomena leading to and using Maxwell's equations. Topics will include static fields in vacuum and in dielectric media, electric and magnetic potentials, and the energy density of electromagnetic fields.
Prerequisites: MATH 254 and PHY 222
Corequisite: MATH 253

PHY 407 - Seminar
Lecture Hours: 6
Lab Hours: 0
Credit Hours: 6
(Hours to be arranged each term.)

PHY 410 - Math Meth: Fourier Optics
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Linear systems, Fourier transforms, and their use in optics. Topics will include special functions, orthogonal expansions, Fourier series and transforms and spectra of functions, mathematical operators, convolution, autocorrelation, cross correlation, linear systems as filters, and signal processing.
Prerequisite: MATH 254

PHY 448 - Geometric Optics
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Reflection and refraction at plane and curved surfaces; imaging properties of lenses; first-order Gaussian optics and thin-lens system layout; matrix optics; ray-tracing software; spherical and chromatic aberrations.
Prerequisite: PHY 223

PHY 449 - Radiometry & Optical Detect
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Fundamentals of radiometry and photometry; detection of light using thermal and photon (photoemissive, photoconductive, and photovoltaic) methods; noise processes; blackbodies; charge transfer devices; spectroradiometry.
Prerequisites: EE 223 and PHY 223

PHY 450 - Physical Optics
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Spherical and planar waves; scalar diffraction theory; Fresnel and Fraunhofer diffraction and application to measurement; interference and interferometers; optical transfer functions; coherent optical systems and holography.
Prerequisite: PHY 223

PHY 451 - Lasers
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Laser radiation properties, laser cavities, coherence, atomic spectra, pumping rate, power gain, threshold conditions, beam shape, mode structure; ion, molecular, solid-state, dye, semiconductor, and fiber lasers.
Prerequisite: EE 450 or PHY 450

PHY 452 - Waveguides and Fiber Optics
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Light propagation in fibers and waveguides; termination, coupling, and splicing of fibers; fiber optic communication; optical time domain reflectometry, fiber amplifiers, and fiber sensors.
Prerequisite: EE 450 or PHY 450

PHY 453 - Optical Metrology
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Modern optical metrology with emphasis on non-destructive testing; Fourier optics; Moiré and polarization methods; classic and holographic interferometry; speckle techniques; fringe analysis.
Prerequisite: EE 450 or PHY 450

PHY 548 - Geometric Optics
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Reflection and refraction at plane and curved surfaces; imaging properties of lenses; first-order Gaussian optics and thin-lens system layout; matrix optics; ray-tracing software; spherical and chromatic aberrations.
Prerequisite: PHY 223

PHY 549 - Radiometry & Optical Detection
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Fundamentals of radiometry and photometry; detection of light using thermal and photon (photoemissive, photoconductive, and photovoltaic) methods; noise processes; blackbodies; charge transfer devices; spectroradiometry.
Prerequisite: PHY 223

PHY 550 - Physical Optics
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Spherical and planar waves; scalar diffraction theory; Fresnel and Fraunhofer diffraction and application to measurement; interference and interferometers; optical transfer functions; coherent optical systems and holography.
Prerequisite: PHY 223

PHY 551 - Lasers
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Laser radiation properties, laser cavities, coherence, atomic spectra, pumping rate, power gain, threshold conditions, beam shape, mode structure; ion, molecular, solid-state, dye, semiconductor, and fiber lasers.
Prerequisites: EE 450/PHY 450 or EE 550/PHY 550

PHY 552 - Waveguides & Fiber Optics
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Light propagation in fibers and waveguides; termination, coupling, and splicing of fibers; fiber optic communication; optical time domain reflectometry, fiber amplifiers, and fiber sensors.
Prerequisites: EE 450/PHY 450 or EE 550/PHY 550

PHY 553 - Optical Metrology
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Modern optical metrology with emphasis on non-destructive testing; Fourier optics; Moiré and polarization methods; classic and holographic interferometry; speckle techniques; fringe analysis.
Prerequisites: EE 450/PHY 450 or EE 550/PHY 550

Political Science

PSCI 107 - Seminar
Lecture Hours: 0
Lab Hours: 0
Credit Hours: 15
(Hours to be arranged each term.)

PSCI 201 - United States Government
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Basic concepts and principles of the America political system.

PSCI 207 - Seminar
Lecture Hours: 6
Lab Hours: 0
Credit Hours: 6
(Hours to be arranged each term.)

PSCI 250 - Intro to World Politics
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Introduction to international relations and global issues. The rise and demise of the Cold War, international efforts towards arms control, and global environmental and economic problems.
Prerequisite: WRI 122

PSCI 307 - Seminar
Lecture Hours: 15
Lab Hours: 15
Credit Hours: 15
(Hours to be arranged each term.)

PSCI 407 - Seminar
Lecture Hours: 6
Lab Hours: 0
Credit Hours: 6
(Hours to be arranged each term.)

PSCI 497 - US Foreign Policy
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
The American foreign policy process, recurring themes in U.S. foreign policy, and the content of U.S. policy in such areas as Europe, Latin America, and the Middle East.
Prerequisite: PSCI 250

Polysomnographic Technology

PSG 107 - Seminar
Lecture Hours: 0
Lab Hours: 0
Credit Hours: 15
(Hours to be arranged each term.)

PSG 207 - Seminar
Lecture Hours: 15
Lab Hours: 15
Credit Hours: 15
(Hours to be arranged each term.)

PSG 211 - Fund of PSG & Patient Care
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Basic concepts of patient care, including consideration of physical and psychological needs of the patient and family. Routine and emergency patient care procedures. Infection control procedures utilizing universal precautions. Role of the polysomnographic technologist in patient education. Ethical and legal issues.

PSG 221 - Physiology of Sleep
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Introduction to sleep architecture and the function of changes in electroencephalograms, electrocardiograms, and electromyograms. Physiology of sleep-induced alterations in pharyngeal muscle tone, autonomic control and polysomnographic staging.

PSG 231 - Sleep Disorders Pathology
Lecture Hours: 4
Lab Hours: 0
Credit Hours: 4
Normal and abnormal sleep disorders integrating the physiological functions of the nervous, respiratory, and cardiovascular systems. Emphasis on basic sleep sciences, physiology, diagnosis and treatment of sleep disorders.
Prerequisite: PSG 221

PSG 246 - Sleep Disorders in Women
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
In-depth study of sleep disorders in women exploring: the menstrual cycle; rhythms and shift working women; polycystic ovary syndrome; endometriosis, fibromyalgia; breast cancer and fatigue; pregnancy and sleep-disordered breathing; insomnia and other medically related sleep disturbances.

PSG 264 - Pediatric/Neonatal Psg
Lecture Hours: 4
Lab Hours: 0
Credit Hours: 4
Presentation of theory and its practical applications in pediatric and neonatal respiratory diseases and other sleep disorders. Includes pathophysiology, etiology, patient testing, scoring and treatment.
Prerequisite: PSG 221 or RPSGT licensed

PSG 271A - Clinical Polysom Tech A
Lecture Hours: 2
Lab Hours: 12
Credit Hours: 6
Medical terminology, instrumentation setup and calibration, 10/20 system, patient hook-ups, recording and monitoring techniques, documentation, event recognition, monitoring, therapeutic intervention, professional issues, and patient-technologist interactions related to polysomnographic technology. Part-time students only, requires 18 nighttime clinical hours weekly.
Pre- or Corequisite: PSG 211

PSG 271B - Clinical Polysom Tech B
Lecture Hours: 2
Lab Hours: 12
Credit Hours: 6
Medical terminology, instrumentation setup and calibration, 10/20 system, patient hook-ups, recording and monitoring techniques, documentation, event recognition, monitoring, therapeutic intervention. Professional issues and patient-technologist interactions related to polysomnographic technology. Part-time students only, requires 18 nighttime clinical hours weekly.
Prerequisite: PSG 271A

PSG 271C - Clinical Polysom Tech C
Lecture Hours: 2
Lab Hours: 12
Credit Hours: 6
Advanced aspects of polysomnographic technology including recognition of sleep disorders, recording and monitoring, therapeutic interventions, scoring, MSLT, RTWS, and neurophysiology interpretation of sleep. Part-time students only, requires 18 daytime clinical hours weekly.
Prerequisite: PSG 271B

PSG 272 - Clinical Polysomngphy Tech I
Lecture Hours: 2
Lab Hours: 27
Credit Hours: 9
Medical Terminology, instrumentation setup and calibration, 10/20 system, patient hook-ups, recording and monitoring techniques, documentation, event recognition, monitoring, therapeutic intervention, professional issues, and patient technologist interactions related to polysomnographic technology. Requires 27 clinical hours weekly at night in the lab.
Pre- or Corequisite: PSG 211

PSG 273 - Clinical Polysomngrphy Tech II
Lecture Hours: 2
Lab Hours: 27
Credit Hours: 9
Advanced aspects of polysomnographic technology including recognition of sleep disorders, recording and monitoring, therapeutic interventions, scoring, Multiple Sleep Latency Test, Repeated Test of Sustained Wakefulness, and neurophysiology interpretation of sleep. Requires 27 clinical hours weekly during the day and night.
Prerequisite: PSG 272

PSG 291 - Clinical Sleep Educator
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Examination of the sleep technologist's increasing involvement in the identification, treatment and long-term monitoring of patients presenting with insomnia, sleep apnea, and poor sleep hygiene. Review of the Clinical Sleep Educator certificate offered by the BRPT.
Prerequisite: PSG 221

Population Health Management

PHM 105 - Intro to Population Health Management
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
This course introduces students to the field of population health management, including the various careers, initiatives, and skills related to population health practice.

PHM 215 - Public Health Policy
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
This course explores public health issues throughout the lifespan and corresponding health policy initiatives designed to reduce prevalence of the preventable diseases. Particular attention will be paid to the collective impact framework for health policy.

PHM 321 - Community Program Planning
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
This course prepares student to identify, develop, and coordinate interventions in a community health setting to target chronic disease risk reduction. Students will gain an understanding of chronic disease epidemiology and best practices in public health programming and gain skills in program planning methods.
Prerequisites: SOC 225 and WRI 227

PHM 345 - Community Health Grant Writing
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
This course prepares students to develop grant proposals to secure funding for health promotion initiatives in a community health setting. Students develop skills to assess the health of target populations, identify pressing health needs, select appropriate

evidence-based programs that address these needs, and prepare information in a grant proposal format.
By the end of this course, students will be able to:

1. Identify contemporary public health issues and explain the diverse approaches used to address them in a community health setting
2. Develop community health assessment skills and identify data collection strategies
3. Develop program planning and evaluation skills for specific community health needs
4. Identify funding resources for community-based health promotion programs
5. Develop grant writing skills

Prerequisites: SOC 225 and WRI 227

PHM 420 - Population Health Management Externship
Lecture Hours: 0
Lab Hours: 0
Credit Hours: (Variable Credit 1-16)
This course prepares students for work in the field of Population Health Management. Students will gain professional experience and apply the knowledge and skills learned in Population Health Management courses to real-world population health issues.

PHM 435 - Research Center
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
The research center course places students as professionals in training at the Population Health Management Research Center. The mission of the Oregon Tech Population Health Management Research Center is to provide students rigorous training in applied social science and community-based research through professional work experience in population health, supporting organizations that promote the education and overall well-being of the region.

Professional Writing

PWR 101 - Introduction to Professional Writing
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Introduction to the skills and tools necessary for a career in writing. Collaborative writing, editing, common genres, giving and receiving professional feedback. Exploration of scientific and technical, digital, and organizational writing to prepare students to choose a major track.
Pre or Corequisite: WRI 121

PWR 102 - Introduction to Web Authoring
Lecture Hours: 2
Lab Hours: 1
Credit Hours: 3
Rhetorically-grounded introduction to web technologies and the history and current state of the internet. Introduction to HTML and CSS. Genres of web content. Managing content on a web server. Introduction to content-management systems. Students will build a personal web page.
Pre or Corequisite: WRI 121

PWR 206 - Social Media
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Strategies for integrating social media and digital marketing as part of professional writing. Practical steps, techniques, and best practices geared toward integrating social media and digital programs into business, personal, and artistic communication.
Prerequisite: WRI 122

PWR 215 - Writing in the Public Interest
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Emphasizes professional writing needs of nonprofit and community stakeholders. Focuses on analyzing particular rhetorical situations and using appropriate rhetorical strategies to produce multiple issue-focused documents in various genres. Culminates in professional portfolio prospective client.
Pre or Corequisite: WRI 227

PWR 220 - Writing for Interactive Media
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Explores writing and editing for visual, audio, and interactive media. Workshops focus on choosing appropriate format and delivery mechanisms for news, Web sites, gaming, etc. Topics include accessibility, copyright law, information ethics, linear and non-linear media, including game writing.
Prerequisite: WRI 122

PWR 306 - Writing for the Health Professions
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Emphasizes professional writing needs of health professionals. Focuses on analyzing particular rhetorical situation and using appropriate rhetorical strategies to produce multiple issue-focused documents in various genres. Culminates in simulated outreach project requiring translation of expert medical content for non-expert audiences.
Prerequisite: WRI 227

PWR 310 - Professional Writing for International Audiences
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Emphasizes professional writing needs of international audiences. Focuses on analyzing and understanding particular international contexts, revising documents according to rhetorical needs, and implementing strategies for creating original documents to address international audiences. Culminates in case study portfolio of professional documents.
Prerequisite: WRI 227

PWR 315 - Advanced Web Authoring
Lecture Hours: 2
Lab Hours: 1
Credit Hours: 3
Advanced use of HTML and CSS. Introduction to database-driven content development including JavaScript, PHP, and MySQL. Choosing and implementing content management systems, content models, and deploying site architecture. Usability testing a website and performing user analytics.
Prerequisites: COM 248 or PWR 102

PWR 320 - Structured Authoring
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Advanced practice in documentation writing, information architecture and modular writing. Students will learn industry-standard writing practices such as Markdown, XML, and DITA. Students will also gain proficiency in content management and writing for re-use.
Prerequisite: WRI 227

PWR 330 - User Research
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Applied research methods for developing interfaces, documents, and applications. Planning, testing, and revising a user experience. User analytics, field methods, interviewing, focus groups, usability testing, and other workplace practices for inquiry into users and audiences.
Prerequisite: WRI 227

PWR 355 - Project Management for Writers
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Focuses on project planning, management, and assessment for large-scale communication (print and electronic) projects. Introduces the theory and practice of audience-, organization-, and process-based approaches to content strategy.
Prerequisites: SPE 321 and WRI 227

PWR 490 - Portfolio Development
Lecture Hours: 0
Lab Hours: 0
Credit Hours: (Variable Credit 2-3)
Focuses on the development of a professional senior portfolio that provides evidence of all writing experience and skill level.
Prerequisite: Any upper division-writing course

PWR 499 - Internship in Professional Writing
Lecture Hours: 0
Lab Hours: 0
Credit Hours: (Variable Credit to 9 credits)
Students work in applied setting in their emphasis and under the supervision of an on-site mentor. Regular contact with extern advisor required. Written externship reports required. Writing proficiency exam must be passed before starting internship. Senior standing required.
Prerequisites: PWR 355 and upper division course in emphasis area

Psychology

PSY 107 - Seminar
Lecture Hours: 0
Lab Hours: 0
Credit Hours: 15
(Hours to be arranged each term.)

PSY 110 - Human Serv Careers
Lecture Hours: 1
Lab Hours: 0
Credit Hours: 1
Presentation and discussion of career options of psychology majors.

PSY 201 - Psychology
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Introduction to the principles and applications of of psychology. Topics include scientific methodology, learning, memory, cognition, and intelligence.

PSY 202 - Psychology
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Introduction to the principles and applications of psychology. Topics include the brain and behavior, consciousness, sensation and perception, health psychology, motivation, and emotion.

PSY 203 - Psychology
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Introduction to the principles and applications of psychology. Topics include social psychology, personality, abnormal psychology, psychotherapy, and development.

PSY 207 - Seminar
Lecture Hours: 6
Lab Hours: 0
Credit Hours: 6
(Hours to be arranged each term.)

PSY 215 - Abnormal Psychology I
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Overview of biological, psychological and social causes of abnormal behavior. Specific topics include models, classification and assessment of abnormal behavior, as well as anxiety, somatoform, dissociative, personality, impulse, alcohol and substance abuse disorders.
Prerequisite: PSY 203 or instructor consent

PSY 216 - Abnormal Psychology II
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Overview of legal and ethical issues related to abnormal psychology. Techniques of group and individual therapy. Specific disorders include: sexual and gender identity, mood, schizophrenia, cognitive, and childhood and adolescence.
Prerequisite: PSY 203

PSY 220 - Community Psych
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Provides a comprehensive understanding of community mental health, social ecology, and program planning/evaluation at the community level. Focuses on understanding community-based research and practice. Critical thinking regarding community and environmental factors and application of theory to solve community problems.
Prerequisite: PSY 203

PSY 225 - Applied Stats for Social Sci
Lecture Hours: 4
Lab Hours: 0
Credit Hours: 4
Provides an overview of basic statistical techniques in social sciences, including t-test, chi-square, ANOVA, correlation, and regression. Students will engage in hands-on experience analyzing, interpreting, and reporting data. Students will develop skills applying basic statistical tests to answer research questions.
Prerequisite: MATH 100 or instructor consent

PSY 301 - Basic Counseling Techniques
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Basic counseling and interpersonal skills, including reflective listening, expressing empathy, questioning, and confrontation are taught. Complex skills such as goal setting, documentation, suicide/homicide crisis intervention, and handling client noncompliance. Laboratory employs CD-ROM and role-playing formats.
Prerequisite: PSY 216

PSY 307 - Seminar
Lecture Hours: 6
Lab Hours: 0
Credit Hours: 6
(Hours to be arranged each term.)

PSY 308 - Psychology of Eating
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Exploration of eating behavior. Psychological, social, and physiological factors will be examined. Application of empirical data to real world experiences. Typical, healthy, and disordered eating behaviors will be considered.

PSY 311 - Human Growth & Dev I
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
A biopsychosocial study of human development from pre-conception through middle childhood. Discusses the biological, psychological, and social processes affecting the developing child. Applications to health care, family, community, and education are discussed.
Prerequisite: PSY 201 or PSY 202 or PSY 203

PSY 312 - Human Growth & Dev II
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
A biopsychosocial study of the continuing development of the human being from adolescence through old age and death. Discusses the biological, psychological, and social processes relevant to this developmental time span. Applications to health care, family, community, and education are discussed.
Prerequisite: PSY 201 or PSY 202 or PSY 203

PSY 313 - Psych Research Methods I
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Overview of the techniques of research in psychology. Emphasis is placed on techniques of quantitative research, including experimental, quasi-experimental, field, and survey research methods. Students are engaged in developing an APA research proposal based on current psychological literature.
Prerequisites: PSY 203 and one of the following: MATH 243 or MATH 361 or PSY 225, all with grade "C" or better

PSY 314 - Psych Research Methods II
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
An in-depth look at advanced research methodology, including complex research design. Students gain experience with research projects by collecting data, analyzing, writing an APA style manuscript, and presenting a conference-style poster.
Prerequisite: PSY 313

PSY 317 - Field & Career Preparation
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Exploration of careers related to the field of psychology. Processes and skills needed for career search and placement. Externship process and opportunities will be discussed.

PSY 321 - Theories of Personality I
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
In-depth coverage of personality theorists/theories, such as Freud, Adler, Horney, Erikson, and the Five Factor Theory. Applications of various theoretical concepts to case studies and to people in their personal lives.
Prerequisite: PSY 201 or PSY 202 or PSY 203

PSY 322 - Theories of Personality II
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
In-depth coverage of personality theorists/theories, such as Maslow, Skinner, Rogers, Bandura, Sociological, and Cultural. Applications of various theoretical concepts to case studies and to people in their personal lives.
Prerequisite: PSY 201 or PSY 202 or PSY 203

PSY 330 - Social Psychology I
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Surveys behavior and experience in a social context. Topics include the self in the social world, attribution, social cognition, affiliation, and romantic relationships. Theory, research, and application discussed.
Prerequisite: PSY 201 or PSY 203

PSY 331 - Social Psychology II
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Surveys behavior and experience in a social context. Topics include social influence, attitudes and persuasion, aggression, group dynamics, altruism, and stereotyping/prejudice/discrimination. Theory, research, and application discussed.
Prerequisite: PSY 201 or PSY 203

PSY 334 - Behavior Modification I
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Measurement of behavior and key concepts of operant learning are covered, e.g., reinforcement, extinction, punishment, stimulus control and shaping, among others. Laboratory exercises are interactive computer simulations of these concepts. First in five course sequence approved by the Behavior Analyst Certification Board as meeting the coursework requirements for eligibility to take the Board Certified Behavior Assistant Analyst Exam. Applicants will have to meet additional requirements to qualify.
Prerequisite: PSY 201 or PSY 202 or PSY 203

PSY 335 - Behavior Modification II
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Principles learned in PSY 334 are applied to the study of human behavior. Complex techniques and new learning concepts found in the 'real world' are also covered. Treatment plans for actual human problem behaviors are created in the laboratory. Second in five course sequence approved by the Behavior Analyst Certification Board as meeting the coursework requirements for eligibility to take the Board Certified Behavior Assistant Analyst Exam. Applicants will have to meet additional requirements as well.
Prerequisite: PSY 334

PSY 336 - Health Psychology I
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
The application of psychological theories to the understanding of the relationship between health, the environment, and behavior. This course focuses on the mind-body connection, stress, realities of healthcare delivery, health behavior change models, and research methods in health psychology.
Prerequisite: PSY 202 or instructor consent

PSY 337 - Health Psychology II
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
The application of psychological theories to understand relationships between health, the environment, and behavior. Focuses on prevention of disease/negative health behaviors, and promotion of health and well-being. Topics include substance abuse, nutrition, exercise, chronic illness, sex, and the built environment.
Prerequisite: PSY 336

PSY 339 - Biopsychology
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Anatomical and physiological basis of behavior patterns presented from genetic, developmental, evolutionary and functional evidence. Discussions of mind-body relationships, senses, sleep, motor activity, emotions, and reproduction.
Prerequisite: BIO 232 or PSY 202 or instructor consent

PSY 341 - Psychoactive Drugs I
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Students will investigate the physiological, behavioral, social, and societal aspects of psychiatric drugs, including anti-anxiety, anti-depressant, and anti-psychotic drugs.
Prerequisite: PSY 202
Pre- or Corequisite: PSY 216

PSY 342 - Psychoactive DrugsII: Abused
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Students will investigate the physiological, behavioral, social, and societal effects of abused drugs including alcohol, hallucinogens, marijuana, opiates, and stimulants.
Prerequisites: PSY 202 or PSY 341, and instructor consent

PSY 345 - Educational Psychology I
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Introduction to psychological concepts, theories, and methodologies as applied to education. Focus will be on the major psychological views of learning and how these can be applied to create effective strategies and environments for teaching and learning.
Prerequisite: PSY 201 or PSY 202 or PSY 203

PSY 346 - Educational Psychology II
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Exploration of psychological principles and theories of teaching and learning. Focus will be on learner motivation, differences, needs, culture, and diversity. How to shape supportive learning environments and form comprehensive teaching will be considered, as will assessment of learning.
Prerequisite: PSY 201 or PSY 202 or PSY 203

PSY 347 - Organizational Behavior
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Psychology applied to business organization and operations as they affect employees, customers, and the community with particular interest on group processes.
Prerequisite: Junior standing or instructor consent

PSY 351 - Cognitive Restructuring I
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Philosophy behind criminal thinking errors, which influence their thought patterns. Laboratory component includes participation in client groups and casework.
Prerequisite: PSY 301 or PSY 334

PSY 355 - Evolutionary Psychology
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Examination of biological determinants underlying human behavior. Discusses family relations, aggression, crime, mating and other social aspects with regard to adaptation and fitness.
Prerequisite: BIO 103 or BIO 213 or PSY 203 or instructor consent

PSY 356 - Military Psychology
Lecture Hours: 3
Lab Hours: 0

Credit Hours: 3
Examination of the mental health and environmental issues facing current and former service members and their families by exploring military culture, theory, assessment, and evidence based interventions.
Prerequisite: PSY 201 or PSY 202 or PSY 203

PSY 358 - Psychology of Gender
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Psychological examination of the functioning, specialization, self-concept, and roles of women and men. Issues that women and men face in the gendered world are critically analyzed scientifically and experientially.
Prerequisite: PSY 201 or PSY 202 or PSY 203

PSY 360 - Organizational Psych
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Psychology applied to human relations problems in the work world. Specific topics include job satisfaction, motivation, leadership, attitudes and effects of stress on employees and job performance.
Prerequisite: PSY 201

PSY 361 - Industrial Psychology
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Application of psychological principles, theories, and behavioral techniques applied to human relations, problems in industrial situations.
Prerequisite: PSY 201 or PSY 202 or PSY 203

PSY 364 - Environmental Psychology
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
An interdisciplinary look into the human-environment interaction in regards to sustainability, conservation, and the natural and built environments. Students will apply psychological theory to understand the role of human behavior, attitudes, policy, and ethics in sustainability and conservation efforts.
Prerequisite: PSY 201

PSY 371 - Human Sexuality I
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Social, cultural, psychological and physiological influences on human sexuality are examined. Topics include: theory and research, gender, anatomy and functioning, and human relationship components, including love and communication.
Prerequisite: PSY 201 or PSY 202 or PSY 203

PSY 372 - Human Sexuality II
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Social, cultural, psychological, and physiological influences on human sexuality are examined. Topics include: sexual orientation, pregnancy, contraceptive practices, sexual dysfunctions, sexually transmitted infections, paraphilias, sexual assault, media images, the sale of sex.
Prerequisite: PSY 201 or PSY 202 or PSY 203

PSY 375 - Organizational Behavior Mgmt
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Introduction to research and practice in Organizational Behavior Management (OBM). Topics include performance management, behavioral systems analysis, process mapping, scientific research in organizational change, and career options for organizational consultants.
Prerequisite: PSY 201

PSY 376 - Foundations of Sports Psych
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Introduction to the foundations of psychology in the sport and physical activity domain. Focus will be on current theories, empirical research, and practices in the field of sport and exercise psychology.
Prerequisite: PSY 201 or PSY 202 or PSY 203

PSY 385 - Peer Mentorship
Lecture Hours: 1
Lab Hours: 3
Credit Hours: 2
Applied learning experience working with college and college bound populations. Enrolled students are engaged as mentors for peers, utilizing and technology to guide successful academic and social college experiences. May be repeated for credit. Not open to first year freshman or first term transfer students.
Prerequisites: 90 credit hours and at least one term at Oregon Tech

PSY 401 - Adv Counseling Techniques
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Major schools of psychotherapy are discussed. Students practice related techniques in the laboratory following demonstration and instruction. Group therapy techniques are emphasized with associated laboratory work using interactive CD-ROM, group therapy videotapes, and a Web site corresponding to readings.
Prerequisite: PSY 301

PSY 407 - Seminar
Lecture Hours: 12
Lab Hours: 0
Credit Hours: 12
(Hours to be arranged each term.)

PSY 410 - Organiz Change/Develop
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Theories and processes necessary to understand and implement change within organizations. Focuses on impact of technological change in organizations and on skill development in planning, implementing, and evaluating change.

PSY 416 - Abnorm Behav Children & Adol
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Highlights differences between children and adults in their expression of emotional and interpersonal problems. Language/learning disabilities, problems of attention deficit, school refusal and separation anxiety, depression, and eating. Description of symptoms and treatments are emphasized.
Prerequisites: PSY 215, PSY 216, PSY 311, and PSY 312

PSY 420 - Applied Psych Extern
Lecture Hours: 0
Lab Hours: 0
Credit Hours: 16
Opportunities to work under supervision in applied settings related to students' career interests. Students apply the knowledge they acquired in their classes and gain experience working in the field.
Prerequisites: PSY 317 with grade "B" or better, approval of the externship coordinator, and completion of at least 120 hours of college credit

PSY 421 - Senior Project I
Lecture Hours: 1
Lab Hours: 6
Credit Hours: 3
First term of a three-term comprehensive project in applied psychology. Focus on refining a research project, literature review, and formulation of research question.
Prerequisite: PSY 313

PSY 422 - Sr Project II
Lecture Hours: 1
Lab Hours: 6
Credit Hours: 3
Second term of a three-term comprehensive project in applied psychology. Focus on development of research methodology and pilot testing of project.
Prerequisite: PSY 421

PSY 423 - Sr Project III
Lecture Hours: 1
Lab Hours: 6
Credit Hours: 3
Third term of a three-term comprehensive project in applied psychology. Focus on data collection, writing of research report and oral presentation of project.
Prerequisite: PSY 422

PSY 425 - Motivational Interviewing
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Motivational interviewing is a highly effective (evidenced based) approach to enhance behavior change in psychotherapy, substance abuse counseling, dentistry, education, various medical professions and business. This course will overview the theory, process, skills and implementation of motivational interviewing.
Prerequisite: PSY 301 or instructor consent

PSY 428 - Animal Behavior
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
The biological foundations of animal behavior are presented from an ethological and comparative psychology perspective. Emphasizes the evolution, development, and physiological basis of behavior patterns and presents topics on learning, perception, orientation, communication, and social behavior. (Cannot be taken for graduation credit by students who have taken BIO 428.)
Prerequisite: BIO 213 or PSY 202

PSY 431 - Family Therapy
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Basic differences between functional and dysfunctional families. Theoretical underpinnings of family therapy, an emphasis on particular theoretical models, different family populations including single parent families, blended families and culturally diverse families.
Prerequisite: PSY 301

PSY 432 - Group Therapy
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Theory and application of group therapy techniques. Historical and current applications of group treatment, special populations and multicultural considerations.
Prerequisite: PSY 301

PSY 434 - Adv Behavior Modification I
Lecture Hours: 4
Lab Hours: 0
Credit Hours: 4
Ethical principles and issues in Applied Behavior Analysis, the methods for measuring and evaluating behavior change, specifically single-subject research designs, and behavioral assessment methods and techniques. Third in five course sequence approved by the Behavior Analyst Certification Board as meeting the coursework requirements for eligibility to take the Board Certified Behavior Assistant Analyst Exam. Applicants will have to meet additional requirements to qualify.
Prerequisite: PSY 313
Pre- or Corequisite: PSY 335

PSY 435 - Adv Behavior Modification II
Lecture Hours: 4
Lab Hours: 0
Credit Hours: 4
Application of principles and techniques of Applied Behavioral Analysis to change behavior and develop systems to support behavior change. Fourth in five course sequence approved by the Behavior Analyst Certification Board as meeting the coursework requirements for eligibility to take the Board Certified Behavior Assistant Analyst Exam. Applicants will have to meet additional requirements to qualify.
Prerequisite: PSY 434

PSY 441 - Youth Mentorship I
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
Applied learning experience working with youth. Enrolled students are engaged as mentors for youth, utilizing skills in guiding social, academic, emotional, and cognitive development. May be repeated for credit.
Prerequisite: Instructor consent

PSY 442 - Youth Mentorship II
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
Applied learning experience working with youth; continuation from PSY 441. Enrolled students are engaged as mentors for youth, utilizing skills in guiding social, academic, emotional, and cognitive development. May be repeated for credit.
Prerequisites: PSY 441 and instructor consent

PSY 443 - Youth Mentorship III
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
Applied learning experience working with youth; continuation from PSY 442. Enrolled students are engaged as mentors for youth, utilizing skills in guiding social, academic, emotional, and cognitive development. May be repeated for credit.
Prerequisites: PSY 442 and instructor consent

PSY 445 - OR Tech Relationship Bldg Prog
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
This course will provide an orientation to and ongoing training for family mentors in the Oregon Tech Relationship Building Program. Program related projects will be assigned based on number of credits (1-3) selected. This course can be repeated for credit.
Prerequisite: PSY 301 or instructor consent

PSY 446 - Psychological Trauma
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Explores and introduces student to psychologically traumatic experiences in terms of definition, impact and reactions, including assessment and treatment of trauma-related psychological problems. Special focus on post-traumatic stress disorder.
Prerequisite: PSY 301

PSY 455 - Cognitive Psychology
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
The scientific study of mental process and how the mind works (or fails to work). Topics include memory, knowing, decision-making, attention, morality, and theories of mind. Students will debate current topics in the field and learn practical applications for cognitive research.
Prerequisite: PSY 201

PSY 456 - Performance Management
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Application of principles and techniques Applied Behavior Analysis to change behavior, focus on implementation, management, and supervision of behavior change programs and systems in business, industry, and human services. Fifth in five course sequence approved by The Behavior Analyst Certification Board, INC. as meeting the coursework requirements for eligibility to take the Board Certified Behavior Assistant Analyst Examination. Applicants will have to meet additional requirements to qualify.
Prerequisite: PSY 434

PSY 475 - Capstone in Applied Psychology
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Provides students the opportunity to synthesize material learned throughout the degree program, create innovative projects, and evaluate new ideas related to higher level topics in applied psychology. Topics vary by term. May be repeated for credit.
Prerequisite: Senior standing or instructor consent

PSY 480 - Theories of Learning
Lecture Hours: 4
Lab Hours: 0
Credit Hours: 4
The basics of the major learning theories as they apply to operant and respondent conditioning, social learning, and memory.
Prerequisite: PSY 335

PSY 485 - Education Assistantship
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Hands on exploration of educational functions with a wide range of possible ages and abilities; will involve tutoring and mentoring with additional specific duties dependent on the goals of each student. May

be repeated for credit.
Prerequisite: Instructor consent

PSY 497 - Special Projects/Training
Lecture Hours: 0
Lab Hours: 6
Credit Hours: 6
Students may enroll for credit in special programs offered by external agencies, approved by the department, leading to the development of specialized skills. Programs may include training to work with special populations. May be taken twice for credit.
Prerequisites: Senior standing in Applied Psychology and HSS department chair consent

PSY 499 - Independent Study
Lecture Hours: 0
Lab Hours: 0
Credit Hours: 6
Intensive self study of a topic in psychology of the student's choosing. Study guided by any professor in the Applied Psychology program. May be repeated, with different topics, up to three times.
Prerequisites: Senior standing in Applied Psychology and HSS department chair consent

PSY 500 - Life Span Development
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Study of principles of human development with emphasis on the contributions of biological, social, psychological, and multicultural influences as applied to an understanding of cognitive, emotional, social, and physical development across the lifespan.

PSY 505 - Law, Ethics, & Prof Develop
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Examines all aspects of therapy that involve statutes, regulations, principles, values and ethics of Marriage and Family Therapists with a special emphasis on the legal and ethical considerations of marriage and family therapy.

PSY 507 - Seminar
Lecture Hours: 0
Lab Hours: 0
Credit Hours: 15
(Hours to be arranged each term.)

PSY 512 - Systems Theory
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
In-depth analysis of Systems Theory in family dynamics. Emphasis placed on structural, strategic, and solution focused applications to counseling.

PSY 513 - Couples Theory
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Overview of the fundamental theoretical foundations of couples therapy, including systemic, communication, interactional theories of behavior as it relates to couples.
Prerequisite: PSY 512

PSY 521 - Individ Counseling Techniques
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Evidence-based counseling interventions including theory and application from the primary schools of psychotherapy including cognitive-behavioral, systems theory, and humanistic.
Prerequisite: PSY 505

PSY 522 - Indiv Counseling Techniques II
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Advanced evidence-based counseling interventions including application of interventions from the primary schools of psychotherapy including cognitive-behavioral, systems theory, and humanistic.
Prerequisite: PSY 521

PSY 525 - Family Therapy I
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Examines theories and techniques of family therapy including various models of family therapy. This course will offer opportunities for practice of the techniques through role-playing and review of therapy sessions.
Prerequisite: PSY 512

PSY 526 - Couples Therapy
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Examines issues related to therapeutic theories and treatment strategies with couples, including marriage, partnership, divorce, parenting and remarriage.
Prerequisite: PSY 513

PSY 530 - Research Methods
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Fundamentals of methods for conducting research including experimental designs and non-experimental designs. Includes program evaluation, clinical studies, ethics, and statistical analysis. Emphasis on ability to critically evaluate research studies and provide a foundation for conducting research.
Prerequisite: Undergraduate statistics class with grade "C" or better

PSY 535 - Treating Diverse Populations
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Examines the cultural contexts of relationships, issues, trends in a diverse society, including culture, ethnicity, nationality, age, gender, sexual orientation, spirituality, religion, larger system and social context. Strengths and limitations of models of treatment as they related to different cultural, economic and ethnic groups.
Prerequisite: PSY 505

PSY 565 - Group Counseling
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Theoretical understanding of group dynamics and group process. Evidenced based group interventions for psychoeducational and process groups.
Prerequisite: PSY 522

PSY 566 - Child & Adolescent Therapy
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Specific emphasis on treatment of children and adolescents. Course materials will cover a variety of childhood disorders and evidence-based interventions including individual and family interventions.
Prerequisites: PSY 500 and PSY 521

PSY 575 - Treatment of Substance Abuse
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Overview of assessment and treatment of substance disorders including cognitive behavioral, group and family interventions.
Prerequisite: PSY 521

Respiratory Care Program

RCP 100 - Matriculation
Lecture Hours: 2
Lab Hours: 0
Credit Hours: 2
A study into the evidence-based and political pressures driving new developments in respiratory care. Considerations and planning for the students emerging role in health care. Online version tailored to degree completion students.

RCP 107 - Seminar
Lecture Hours: 0
Lab Hours: 0
Credit Hours: 15
(Hours to be arranged each term.)

RCP 120 - Interventions in Gas Exchange
Lecture Hours: 4
Lab Hours: 0
Credit Hours: 4
An Introduction to the effects of ineffective breathing on carbon dioxide removal and oxygen delivery. Basic pulmonary mechanics are described. The vascular effects of hypoxemia are fully explored. Oxygen therapy and Continuous Positive Airway Pressure are introduced.

RCP 207 - Seminar
Lecture Hours: 15
Lab Hours: 0
Credit Hours: 15
(Hours to be arranged each term.)

RCP 223 - Emergent Chest Radio Interpret
Lecture Hours: 2
Lab Hours: 0
Credit Hours: 2
The evaluation of the chest radiograph in the intensive care setting. Students learn to identify structures and fissures as well as the significance of silhouette sign, blunted costophrenic angles, air bronchograms and hyperlucency. The identification of pneumothorax infiltrates and the correct placement of tubes is required.
Prerequisite: RCP 236

RCP 231 - Pulmonary Physiology
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Pulmonary physiology including the mechanics of ventilation, gas diffusion, acid-base regulation, oxygenation, and the physiologic advantage of structure. Gas laws and surface tension as applied to the understanding of clinical problems.
Prerequisite: BIO 233

RCP 235 - Arterial Blood Gases
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Chemistry and classification of acid-base balance including determination of compensation and pathophysiologic causes. Assessment of partial pressures of oxygen saturation, and total oxygen delivery.
Prerequisite: Admission to the Respiratory Care program or instructor consent

RCP 236 - Cardiopulmonary Dynamics
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
Exploration of pulmonary mechanics as measured by spirometry. Cardiovascular hemodynamics including cardiac electrophysiology, rhythm recognition and the measurement and interpretation of Systemic Vascular Resistance and Pulmonary Vascular Resistance, Central Venous Pressures, Pulmonary Artery and Pulmonary Capillary Wedge Pressures.
Prerequisite: Admission to the Respiratory Care program or instructor consent

RCP 241 - Respiratory Gas Therapeutics
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Physical and chemical applications of medical gases and humidity therapy to patient care. The transportation, regulation and dissemination of compressed gases. Clinical decision-making strategies for oxygen titration.
Prerequisite: Admission to the Respiratory Care program

RCP 252 - Cardiopulmonary Pharmacology
Lecture Hours: 4
Lab Hours: 0
Credit Hours: 4
A study of the administration, pharmacokinetics, administration and actions of medications. Emphasis is placed on bronchodilators, steroids, mucolytics and antileukotriene agents. Vasoactive, antiarrhythmics, diuretics, sedatives, antimicrobials and neuromuscular blocking agents are introduced.
Prerequisite: CHE 360

RCP 307 - Seminar
Lecture Hours: 15
Lab Hours: 0
Credit Hours: 15
(Hours to be arranged each term.)

RCP 326 - Preparedness, Ethics, and Leadership
Lecture Hours: 2
Lab Hours: 0
Credit Hours: 2
Preparation for extreme natural and medical disasters, including the impact on facilities, patients, and staff during these events. Ethics in the profession including privacy and social responsibility. Exploration of leadership theory and practice, along with the impact in the healthcare environment. Students will be able to discuss ethical decision-making, leadership practice, and managing through difficult situations.
Prerequisite: RCP 235

RCP 335 - Exercise Physiol and Education
Lecture Hours: 2
Lab Hours: 0
Credit Hours: 2
Introduction to the physiology of exercise, exercise in disease and health and stress testing. Concepts of age appropriate pulmonary rehabilitation and asthma education are described.
Prerequisite: RCP 235

RCP 336 - Hyperinflation Therapies
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
Study and evidence-based application of PEEP, CPAP, bi-level ventilation, IPPB, and incentive spirometry. Flutter valve, PEP, high frequency chest wall oscillation and other methods of improving bronchial hygiene and lung volume. Acquisition and interpretation of the patient history, physical examination, auscultation, vital signs, laboratory data including arterial blood gases and dysrhythmia recognition. Collaborative activities include the acquisition, analysis and communication of findings.
Prerequisite: RCP 236 and RCP 241

RCP 337 - Pulmonary Pathology
Lecture Hours: 4
Lab Hours: 0
Credit Hours: 4
Case-based approach to the understanding, evaluation and treatment of pulmonary disease. Recognition of obstructive and restrictive disease patterns as well as the classification of acid-base and oxygenation disorders. Classification, application and pharmacodynamics of common pulmonary medications are discussed.
Prerequisite: RCP 235

RCP 345 - Cardiopulmonary Diag & Monitor
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
Collaborative investigation, practicum calibration and interpretation of spirometry, body plethysmography, diffusion capacity helium dilution, seven minute nitrogen washout, cardiopulmonary stress testing, 12 lead ECG acquisition, dysrhythmia recognition, arterial blood gas instrumentation.
Prerequisite: RCP 337

RCP 350 - Introduction to Clinical
Lecture Hours: 1
Lab Hours: 24
Credit Hours: 9
Orientation to clinical practice in hospitals. Requires successful criminal background check, drug screening, completion of training in computer charting, and compliance with Health Insurance Portability and Accountability (HIPAA). Competence developed in the area of basic patient assessment, oxygen therapy, aerosol therapy and mechanical ventilation.
Prerequisite: RCP 241

RCP 351 - Mechanical Ventilation I
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Study of an array of artificial airways. Includes laboratory practice in intubation, endotracheal suctioning and bag-mask-valve ventilation. Study and practice of mechanical ventilation circuits, classes of mechanical ventilators and modes.
Prerequisite: RCP 235

RCP 352 - Mechanical Ventilation II
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Description and analysis of adult patient mechanical ventilator system including the initiation, assessment, management and discontinuance.
Prerequisite: RCP 351

RCP 353 - Mechanical Ventilation III
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Advanced topics in mechanical ventilation including transport, dual modes, neonatal

and pediatric mechanical ventilation.
Prerequisite: RCP 352

RCP 366 - Clinical Simulation
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
The practice and measurement of critical thinking in the context of computer branching logic simulations. Students used organized sequential topical examinations to review and measure retention of respiratory care content. Passage of secure national review examination required.
Prerequisite: RCP 337

RCP 375 - Pediatric Care
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Fundamental care of pediatric patients with an emphasis in acute care medicine. A review of common diagnosis, conditions affecting respiratory status, and treatments seen in the pediatric population. Special procedures along with Trauma and Emergency room care will be reviewed.

RCP 386 - Critical Care I
Lecture Hours: 4
Lab Hours: 0
Credit Hours: 4
Analysis and application of critical care techniques with an emphasis in cardiovascular management and assessment. Cardiovascular catheters and hemodynamics, advanced rhythm recognition, and the essentials of advanced cardiac life support.
Prerequisite: RCP 337

RCP 387 - Critical Care II
Lecture Hours: 2
Lab Hours: 0
Credit Hours: 2
Advanced techniques during intubation. Assessment of the difficult airway including Mallampatti classification and thyromental distance. Continued practice and an extension of hemodynamic, pharmacology and imaging knowledge. Students practice anticipating care based on nutritional status.
Prerequisite: RCP 241

RCP 388 - Adv Neonatal Respiratory Care
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Survey of perinatal physiology with an emphasis on mechanical ventilation, the application of oxygen, medications, positive pressure, resuscitative efforts and evaluations as applied to the neonatal and pediatric patients. Instruction in neonatal resuscitation meets the standards established by the American Academy of Pediatrics.
Prerequisite: RCP 241

RCP 389 - International Neonatology
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Advanced topics in neonatal and pediatric respiratory care including transport, stabilization and care in resource limited international settings.
Prerequisite: RCP 241

RCP 407 - Seminar
Lecture Hours: 0
Lab Hours: 0
Credit Hours: 15
(Hours to be arranged each term.)

RCP 440 - Case Management I
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Current clinical cases used as the basis for scholarly research and discussion. Students design a research-based senior project in the field of respiratory care, including interviews, research, literature review and formal presentation.
Prerequisite: Completion of all academic coursework in the Respiratory Care Program prior to the Senior year

RCP 441 - Case Management II
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Current clinical cases used as the basis for scholarly research and discussion. Students continue to work on senior project in the field of respiratory care, including interviews, research, literature review and formal presentation.
Prerequisite: RCP 440

RCP 442 - Case Management III
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Current clinical cases used as the basis for scholarly research and discussion. Students continue work on senior project in the field of respiratory care, including interviews, research, literature review and formal presentation.
Prerequisite: RCP 441

RCP 450 - Clinical Care I
Lecture Hours: 1
Lab Hours: 24
Credit Hours: 9
Continued development of respiratory care skills, mechanical ventilation and neonatal intensive care, expanded functions and observations in specialty areas.

RCP 451 - Clinical Care II
Lecture Hours: 1
Lab Hours: 24
Credit Hours: 9
Continued development of respiratory care skills, mechanical ventilation and neonatal intensive care, expanded functions and observations in specialty areas.
Prerequisite: RCP 450

RCP 452 - Clinical Care III
Lecture Hours: 0
Lab Hours: 36
Credit Hours: 12
Continued development of respiratory care skills, mechanical ventilation and neonatal intensive care, expanded functions and observations in specialty areas.
Prerequisite: RCP 451

RCP 460 - Advanced Life Support
Lecture Hours: 0
Lab Hours: 6
Credit Hours: 2
Students become certified or recertified in professional life support classes such as Basic Life Support, Advanced Cardiac Life Support, Neonatal Life Support, Pediatric Life Support. Clinical simulations and other credentialing exam preparation included.
Prerequisite: RCP 252

RCP 486 - Extreme Physiology
Lecture Hours: 2
Lab Hours: 0
Credit Hours: 2
Physiologic adaptations to gas exchange and transport which occurs during the challenges of neonatal transition, exercise, high altitude and high-pressure environments.
Prerequisites: RRT credential and admission to the degree completion program

RCP 487 - Expert Mechanical Ventilation
Lecture Hours: 2
Lab Hours: 0
Credit Hours: 2
Recognition of levels of quality in mechanical ventilation. Practicing clinicians balance experience with current evidence-based recommendations for mechanical ventilation in order to develop a hierarchy of quality care. Includes selection of new modes, patient-ventilator synchrony, the reduction of medical errors and ventilator-associated pneumonia.
Prerequisites: RRT credential and admission to the degree completion program

RCP 488 - Respiratory Care Innovations
Lecture Hours: 2
Lab Hours: 0
Credit Hours: 2
Exploration of new opportunities to improve access to respiratory care. Reduction of disease through the expansion of respiratory care. Student projects focused on networking among students and faculty and across institutional, professional and nonprofit lines to implement improvements in health education.
Prerequisites: RRT credential and admission to the degree completion program

RCP 561 - Individual Development Plan
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Collaboration, negotiation and the development of priorities for program planning. Systematic planning required for

the development and documentation of four professional competencies.
Prerequisites: State license, current respiratory care employment and the National Board for Respiratory Care (RRT) credential

RCP 565 - Clinical Preceptorship
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Clinical practice beyond that of an advanced graduate as described in the OIT approved IDP. Areas for development of advanced clinical practice include the intensive care units, pulmonary rehabilitation, research, home care, education and management. Course completion is required for the fulfillment of the IDP.
Prerequisite: RCP 561

RCP 575 - Accreditation Practicum
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Respiratory Care leaders are proactive in the validation of their programs through accreditation. This practicum provides the emerging leader with a practical familiarity with program data collection and the assessment of that data in comparison to accreditation standards. Methods of improving the outcomes of individual programs are studied. Course completion requires fulfillment of IDP.
Prerequisite: RCP 561

Radiologic Science

RDSC 105 - Rad Protection & Q C
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Principles of radiation protection and radiographic quality control for veterinary x-ray operators in accordance with Oregon Administrative Rules. Students majoring in Radiologic Science are not eligible.

RDSC 107 - Seminar
Lecture Hours: 0
Lab Hours: 0
Credit Hours: 15
(Hours to be arranged each term.)

RDSC 201 - Imaging Techniques I
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Demonstration and practice with the phenomena and causes of image formation and visualization. The context includes studies of effects of technique-factor changes, effects of the use of various accessories and effects of chemicals in film processing. Causes of radiographic artifacts are discussed and explored. Includes the study of interactions of radiation and matter.
Prerequisite: MIT 103 with grade "C" or better

RDSC 202 - Imaging Techniques II
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Radiographic principles and principles of radiographic quality. Study of theory and practice in methods of protection against ionizing radiation.
Prerequisite: RDSC 201 with grade "C" or better

RDSC 205 - Patient Care
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Basic concepts of patient care, including consideration of physical and psychological needs of the patient and family. Routine and emergency patient care procedures. Infection control procedures utilizing Universal Precautions. Role of the radiographer in patient education.
Prerequisite: MIT 103

RDSC 207 - Seminar
Lecture Hours: 0
Lab Hours: 0
Credit Hours: 6
(Hours to be arranged each term.)

RDSC 210 - Radiograph Position I
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Demonstration and practice of the routine and special radiographic positions of bones of the upper and lower extremities excluding the shoulder and pelvic girdles.
Prerequisites: RDSC 201 and RDSC 235, both with grade "C" or better

RDSC 211 - Radiograph Position II
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Demonstration and practice of routine and special radiographic positions of the axial skeleton, shoulder, and pelvic girdles.
Prerequisites: RDSC 202, RDSC 210, and RDSC 235, all with grade "C" or better

RDSC 233 - Contrast Media Proc
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Routine radiographic examinations of the urinary system, gastrointestinal biliary system, respiratory system, and nervous system, using various contrast medias and filming techniques. All radiographically significant anatomy, physiology, pathology, terminology, and topography, including all contrast studies of these systems.
Prerequisites: RDSC 202, RDSC 210, RDSC 235, all with grade "C" or better

RDSC 235 - Equipment Operation & Maint
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Basic components and operation of radiographic, fluoroscopic, and mobile units. Evaluation, calibration, and maintenance of radiographic equipment and accessories.

RDSC 272 - Radiation Protection
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Basic properties, sources, units of measurement, dosimetry and biological effects of radiation. Methods of personnel protection and minimizing patient exposure. NCRP recommendations for protective devices and personnel monitoring.
Prerequisites: RDSC 201 and RDSC 235, both with grade "C" or better

RDSC 301 - Radiograph Position III
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Demonstration and practice of routine and special radiographic positions of the skull, facial bones, and paranasal sinuses.
Prerequisites: RDSC 211 and RDSC 233, both with grade "C" or better

RDSC 307 - Seminar
Lecture Hours: 15
Lab Hours: 15
Credit Hours: 15
(Hours to be arranged each term.)

RDSC 320 - Surg/Trauma/Mobl Rdgrph
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Routine radiographic examinations of the reproductive, muscular, nervous, skeletal and circulatory systems. Also including emergency and surgical procedures, using various contrast media and filming techniques. The comprehensive study of all radiographically significant anatomy, physiology, pathology, terminology, and topography including all contrast studies of these systems. Control of microorganism by physical and chemical means is incorporated as necessary.

RDSC 326 - Crdvsclr/Interv Tech
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Demonstration and practice of special radiographic examinations of nervous and vascular systems including use of serial film changers and pressure injectors, and other necessary equipment. Also includes related nursing procedures.
Prerequisites: RDSC 211, RDSC 233, and RDSC 320, all with grade "C" or better

RDSC 350 - Bones: Interact. Anat & Pos'n
Lecture Hours: 2
Lab Hours: 0
Credit Hours: 2
A sequential review of osteology and positioning designed for the medical imaging student who has completed the

positioning sequence, or the graduate seeking continuing education credit.
Prerequisites: RDSC 210, RDSC 211, and RDSC 301, or Registered Radiologic Technologist

RDSC 354 - Mammography
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
An in-depth analysis of mammographic positioning, exposure techniques, quality control, film critiquing, and radiation safety. Includes mock registry exam.
Prerequisite: RDSC 301

RDSC 355 - Computed Tomography
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
X-ray physics, scanner components and data acquisition of computed tomography. Image reconstruction, manipulation and artifacts. CT patient care and imaging procedures of the head, neck, spine, chest, abdomen, pelvis and musculoskeletal system.
Prerequisite: BIO 335

RDSC 366 - Radiographic Pathology
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
An overview of common pathological conditions encountered in the clinical setting, for RDSC students. Pathology is categorized by body systems. The students will learn the pathology as they relate to: signs and symptoms, etiology, imaging diagnosis and prognosis and treatment.

RDSC 388 - Externship Preparation
Lecture Hours: 2
Lab Hours: 0
Credit Hours: 2
Presentation of key concepts related to Radiologic Science externship and required in-services. Focus is on patient care and interpersonal scenarios the externship student will likely face while in the clinical environment. Review and discussion of the RDSC Externship Handbook. This course is a mandatory course that must be completed prior to externship.
Prerequisite: RDSC 356

RDSC 407 - Seminar
Lecture Hours: 0
Lab Hours: 0
Credit Hours: 12
(Hours to be arranged each term)

RDSC 410 - Rad Science Externship
Lecture Hours: 0
Lab Hours: 0
Credit Hours: 15
Students must complete four terms (12 months) of clinical experience in both general radiography and special imaging modalities to include computerized tomography, ultrasound, nuclear medicine and/or special radiographic procedures in an affiliated hospital. The student will complete all phases of general radiography and one month in each of three of the special imaging modalities. Affiliated hospitals are approved by the Joint Review Committee on Education in Radiologic Technology. The students are under the direct supervision of qualified radiographers and radiologists.
Prerequisite: All academic coursework in the Radiologic Science curriculum

RDSC 411 - Special Rad Sci Extern
Lecture Hours: 0
Lab Hours: 0
Credit Hours: 15
This one-term (3-month) practicum is designed to develop the skills of the student in the special imaging modalities, i.e., computed tomography, magnetic resonance imaging, ultrasound, nuclear medicine and special radiographic procedures. The student is sent to an affiliated hospital that has the required special imaging equipment to give the hands-on experience to develop competency in each of three areas chosen by the student. The student will spend one month in each selected area.
Prerequisites: All academic coursework in the Medical Imaging program with grade "C" or better and be a Registered Technologist

RDSC 411A - Special Rad Sci Extern
Lecture Hours: 0
Lab Hours: 0
Credit Hours: 7
This two term practicum is designed to develop skills of the degree completion student in special imaging modalities of computed tomography, magnetic resonance imaging, cardiovascular/interventional technology, mammography, quality assurance, nuclear medicine technology, or sonography. The student selects a local hospital or medical center that has the necessary equipment. Upon approval of the facility, the student begins a supervised experience to develop competencies in each of three chosen areas.
Prerequisites: All academic coursework in the Medical Imaging program with grade "C" or better and an ARRT registered technologist in good standing

RDSC 411B - Special Rad Sci Extern
Lecture Hours: 0
Lab Hours: 0
Credit Hours: 8
This two term practicum is designed to develop skills of the degree completion student in special imaging modalities of computed tomography, magnetic resonance imaging, cardiovascular/interventional technology, mammography, quality assurance, nuclear medicine technology, or sonography. The student selects a local hospital or medical center that has the necessary equipment. Upon approval of the facility, the student begins a supervised experience to develop competencies in each of three chosen areas.
Prerequisites: All academic coursework in the Medical Imaging program with grade "C" or better and an ARRT registered technologist in good standing

RDSC 471 - Clinical Imaging Ed I
Lecture Hours: 1
Lab Hours: 0
Credit Hours: 1
Development and application of clinical education objectives relating to medical imaging technology. Instruments used to evaluate student clinical performance and competence.
Prerequisite: RT(R) (ARRT)

Renewable Energy Engineering

REE 107 - Seminar
Lecture Hours: 0
Lab Hours: 0
Credit Hours: 15
(Hours to be arranged each term.)

REE 201 - Intro to Renewable Energy
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
An introduction to renewable energy. Topics include photovoltaics, solar thermal systems, green building, fuel cells, hydrogen, wind power, waste heat, biofuels, wave power, tidal power and hydroelectric. Discussions of economic, environment, politics and social policy are integral components of the course.
Prerequisite: MATH 111

REE 207 - Seminar
Lecture Hours: 10
Lab Hours: 0
Credit Hours: 10
(Hours to be arranged each term.)

REE 243 - Electrical Power
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Fundamentals of electrical power. Power systems components and equipment. Fundamental analysis and design of electrical power systems.
Prerequisites: EE 223, MATH 252, and PHY 222

REE 253 - Electromech Energy Conversion
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
Motoring and generating principles for direct current, synchronous, and induction machines. Analysis and design of motor and generator power and control circuits.
Prerequisites: EE 223, MATH 252, and PHY 222

REE 307 - Seminar
Lecture Hours: 12
Lab Hours: 0

Credit Hours: 12
(Hours to be arranged each term.)

REE 331 - Fuel Cells
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
Introduction to fuel cell technologies: PEM, PAFC, AFC, SOFC, MCFC and DMFC systems. Fuel cell components and systems; field flow plates, electrolytes, electrode materials, electrode catalysts, on-board reformers. Portable devices, utility-scale power production, transportation systems. Fuel types and fuel storage.
Prerequisites: CHE 260 with grade "C" or better and PHY 222

REE 333 - Batteries
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
This course covers fundamentals of the most important battery types including alkaline, zinc-air, lead-acid, nickel-cadmium, nickel-metal hydride, lithium ion, and lithium polymer. Applications include stationary, transportation, and portable batteries. The lab deals with battery system design, testing, and prototype assembly.
Prerequisite: CHE 260 with grade "C" or better

REE 335 - Hydrogen
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
This course will cover hydrogen production, storage, distribution, and use. Specific energy scenarios such as renewable hydrogen cycles will be explored focusing on transportation applications. The concept of hydrogen economy will be discussed in the context of global energy crisis.
Prerequisite: CHE 260 with grade "C" or better

REE 337 - Materials for RE Applications
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Electrical, mechanical, thermal, chemical, optical and processing properties of material in renewable energy systems; solid state device characteristics and their material properties. Engineering applications.
Prerequisites: CHE 202 and CHE 205 or CHE 222, and PHY 223

REE 344 - Nuclear Energy
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Introduction to nuclear energy. Atomic and nuclear physics; the interaction of radiation and matter. Nuclear reactor operation; reactor components, nuclear cycles, neutron diffusion and moderation. Reactor shielding. Fuel reprocessing and wasted disposal. Reactor licensing and safety. Economics and environmental concerns.
Prerequisites: CHE 202 and CHE 205 or CHE 222, and PHY 223

REE 345 - Wind Power
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Introduction to power production from wind resources. Historical uses of wind resources. The Earth's wind systems. Physics of wind power. Vertical and horizontal axis turbines. Aerodynamics of wind turbines. Large-scale turbine farms and sighting. Commercial development, economics and environmental impacts.
Prerequisites: MECH 326 or REE 253, and PHY 222

REE 346 - Biofuels and Biomass
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
Introduction to power production from biomass resources. Historical uses of biomass resources. Biomass as a solar energy store; forestry and agricultural sources, crop wastes. Recycled sources; municipal solid wastes, landfill gas. Gaseous fuels, anaerobic digestion, gasification, liquid fuels, fermentation, hydrolysis, transesterification.
Prerequisites: CHE 202 and CHE 205, or CHE 222, and PHY 222

REE 347 - Hydroelectric Power
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Introduction to hydro-resource power production. Hydro power in history. Physics of hydrology. Power, head, flowrate. Turbine hydrodynamics; Francis, Kaplan, Pelton, Turgo, cross-flow. System components: generators, governors, penstocks, spillways, valves, gates, trash racks. Large-scale and micro hydroelectric systems. Pumped storage. Economic, environmental considerations.
Prerequisite: MECH 318

REE 348 - Solar Thermal Energy Systems
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Introduction to solar thermal energy systems for residential, commercial and industrial applications. Solar radiation; topics in heat transfer; flat plate and concentrating collectors; non-imaging optics; applications including water heating, building heating, cooling, industrial process heat, distillation solar thermal power systems.
Prerequisite: ENGR 355

REE 407 - Seminar
Lecture Hours: 12
Lab Hours: 0
Credit Hours: 12
(Hours to be arranged each term.)

REE 412 - Photovoltaic Systems
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
The solar resource, sun charts, site assessments. Grid-connected and stand-alone systems. Module and array performance, PV systems components including batteries, modules, charge controllers, maximum power point trackers, inverters. Economic considerations including investment tax credits, present-value analysis, IRR. Advanced PV materials.
Prerequisite: EE 321 and PHY 223

REE 413 - Electric Power Conv Systems
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
Power electronics devices in energy applications. DC-DC MPPT and charge controllers. Advanced inverter controls and applications. FACTS and HVDC systems and equipment.
Prerequisite: EE 419

REE 425 - Electricity Markets & Modeling
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Introduction to restructured electricity markets. Students gain knowledge of theory, structures, successes and failures of markets, market participant behavior, risk, and uncertainty, and basic simulation and optimization modeling for market analyses.
Prerequisites: ECO 201 or ECO 202, and EE 221, all with grade "C" or better

REE 427 - Greenhouse Gas Acct/Footprints
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Course topics include US and international greenhouse gas (GHG) management policies. GHG assessment methods and tools, emissions trading programs, climate risk and tools, emissions trading programs, climate risk and management, data and information sources, measurement standards and protocols, and related sustainability concepts and policies. Cross-listed as ENV 427. Cannot be used for graduation credit by students who have taken ENV 427.
Prerequisites: Junior or Senior standing, MATH 361 or MATH 465 with grade "C" or better, and WRI 227 with grade "C" or better, or instructor consent

REE 431 - Geotherm Heat Pump Desgn
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Theory/design of geothermal heat pum applications, emphasis ground heat exchanger simulation and design. Closed-loop, open loop, and hybrid geothermal heat pump systems will be examined. Exposure to the development and use of geothermal

design and simulation tools.
Prerequisite: MECH 323

REE 439 - Energy Systems Auditing and Management
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Evaluating building thermal/electric/process loads, including lighting, hot water, HVAC and central plant systems, industrial refrigeration and motors. Opportunities for managing energy use through controls and operations/maintenance strategies. Roles of commissioning, energy auditing, renewables, and economic analysis in reducing use.
Prerequisite: MECH 323

REE 451 - Geo Enrgy & direct use app
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Introduction to basic geothermal energy sources and generation. Basic geothermal energy applications including direct use, heat pumps and power generation. Geothermal reservoir, site analysis, exploration and drilling. Direct use application system design (HVAC) and equipment.
Prerequisite: ENGR 355

REE 453 - Power System Analysis
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Faults: symmetric, unsymmetric. Modeling system components using positive, negative, zero sequence networks. System admittance matrixes. Load flow computational methods such as Gauss-Seidel, Newton-Raphson. Power system stabilization. Power system analysis using software, emphasizing renewable resources.
Prerequisite: REE 243

REE 454 - Power Syst Protection & Ctnrl
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Protection systems overview; protective devices; coordination and sequencing of relays; grounding practices; impedance protection. Methods of power systems operation and control; load-frequency control, automatic generation control. Modeling power systems protection and control using power system analysis software, emphasizing renewable resources.
Prerequisite: REE 453

REE 455 - Energy Efficient Building Dsgn
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Principles of integrated, energy-efficient building design. Interpretation/application of codes, standards. Use of software tools for modeling, simulation of building energy systems. Daylighting, natural ventilation, architectural features of passive solar buildings. Inclusion of renewable resources, and net-zero designs. Life-cycle economic analysis.
Prerequisite: MECH 323

REE 463 - Energy Systems Instrumentation
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
Application of electrical and mechanical sensors, data acquisition, logic controllers as applied to energy systems. Determination of physical parameters necessary for control and data logging. Methods of calibration and correction.
Prerequisite: EE 321

REE 465 - Renewable Energy Transport Sys
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Renewable energy transportation systems including fuel cells, hybrid gasoline-electric engines, electric vehicles, bio-diesel, flex-fuel vehicles, high efficiency diesel engines, gas turbine prime-mover systems. Topics include fuel air mixing, fuel storage, fuel delivery, cooling, fuel leak detection, chemical safety, and electrical power control systems.
Prerequisites: MECH 326 or REE 253

REE 469 - Grid Integration of Renewables
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Issues unique to connecting renewable energy generation to the grid. Microgrids. Stability, transient and harmonic effects. Interconnect agreements and requirements. Standard development. SCADA and smart grid concepts. Systems optimization.
Prerequisite: REE 453

REE 471 - Geothermal Powr Plnt Desgn
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Introduction to geothermal reservoir pressure, temperature and flow models, and analysis. Basic geothermal power plant equipment and design for dry team, single/double flash and binary cycle power plants. Plant thermodynamic analysis/efficiency using Rankine/Kalina cycles. Plant environmental, economic and social impacts.
Prerequisite: ENGR 355

REE 511 - Research Methods/Innovation I
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Fundamental concepts of scientific research. An introduction the concepts underlying peer-reviewed research, evaluating the relevance and impact of sources, conducting literature reviews, evaluating published findings, using statistical methods, designing research studies, and writing scholarly articles.

REE 512 - Research Methods/Innov II
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Intellectual property (IP) development, evaluation, and strategy. IP fundamentals, patent fundamentals, conducting patentability searches, evaluating the patentability potential of an invention, drafting invention disclosures for patent applications, assessing the value of a patent or patent portfolio, and IP licensing fundamentals.

REE 513 - Research Methods/Innov III
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Strategy and innovation concepts with a focus on technology commercialization. Business strategy frameworks, financial analysis, strategic marketing, operations management, business models, project management, business law, and entrepreneurship.

REE 515 - Energy Engineering I
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Three-term sequence in energy engineering. For a variety of renewable and conventional means of energy production, storage, and distribution, students gain a robust understanding of resources, energy conversion technology, integration with existing systems, regulatory contexts, business environment, and future trends.

REE 516 - Energy Engineering II
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Three-term sequence in energy engineering. For a variety of renewable and conventional means of energy production, storage, and distribution, students gain a robust understanding of resources, energy conversion technology, integration with existing systems, regulatory contexts, business environment, and future trends.

REE 517 - Energy Engineering III
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Three-term sequence in energy engineering. For a variety of renewable and conventional means of energy production, storage, and distribution, students gain a robust understanding of resources, energy conversion technology, integration with existing systems, regulatory contexts, business environment, and future trends.

REE 521 - Production of Biomass/Biofuels
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
The use of recently living plant or animal materials as sources of fuels, chemicals or industrial products. Sourcing and production. Biomass chemistry; lignocellulosics, fats, oils, saccharides, polysaccharides, proteins, and extractables. Chemical modification of biomass to produce fuels, polymers, industrial chemicals.

REE 523 - Hydrogen Productn and Storage
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
An overview of primary technologies, economic aspects, and social policy issues related to development of hydrogen systems and hydrogen economy, including water electrolysis, reformer technologies, and hydrogen storage.

REE 525 - Solid-State Physics/Photov Mat
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Principles of PV; electrons and holes in semiconductors; junction analysis. Survey of available semiconductors and materials choices for photovoltaic design. Principles of important photovoltaic devices. Monocrystalline, polycrystalline, and thin film solar cells. Strategies for high efficiency. Photovoltaic materials and phenomena.

REE 527 - Wind Power Generators
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
AC machines, particularly three-phase induction and synchronous generators for wind power generation. Equivalent circuit models. Wound-rotor, permanent magnet, multi-pole, and switched-reluctance generators. Power and torque control.

REE 529 - Power System Analysis
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Faults: symmetric, unsymmetric. Modeling system components using positive, negative, zero sequence networks. System admittance matrixes. Load flow computational methods such as Gauss-Seidel, Newton-Raphson. Power system stabilization. Power system analysis using software, emphasizing renewable resources. Requires background in power systems.

REE 531 - Ground-Source Heat Pumps
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Heat pump design and operation. Heat pump cycles. Refrigerant selection. Ground-loop design. Heat transfer issues pertaining to geothermal energy. System design and integration. Temperature and materials issues unique to geothermal heat pumps.

REE 533 - Heating, Ventilation/Air Condi
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Heating, ventilating, and air conditioning. Application of laws and principles of thermodynamics to analysis, design, and control of mechanically controlled environments for human comfort, animal health, and food preservation. Teaches computation of heating and cooling loads, humidity control, heating, and refrigeration.

REE 535 - Fuel Cell Fundamentals
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Basic science and technology of fuel cells, electrode processes, electrolyte types, catalysts, and balance of plant components.

REE 537 - Sustainability/Energy Systems
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Comprehensive examination and classification of the local, regional, and global environmental and social aspects of energy use including lifecycle assessments. Impacts of global and national politics on energy use decisions.

REE 539 - Hydraulics/Fluid Mech/Hydropow
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Open-channel hydraulics, including watershed hydrology, sediment transport and bed load movement, reservoirs, hydrostatics, dredging, spillways, Silling basins, and hydraulic jumps. Advanced fluid mechanics. Types of turbines Modeling and unit optimization. Background in fluid mechanics required.

REE 541 - Utiliztn Strategies/Bioenergy
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Strategies for sustainable energy production from biomass. Direct combustion. Fermentation processes. Anaerobic digestion systems. Thermochemical processes; gasification, liquefaction. Chemical synthesis pathways.

REE 543 - Matrls f/Electrochemical Proc
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Materials used for batteries, fuel cells, electrolyzers, and supercapacitors; their classification, selection and properties, including nanocatalysts, polymer electrolytes, ceramic and plastic packaging materials, and metals.

REE 545 - Applied Photovoltaics
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
The characteristics of sunlight. Solar cell behavior, properties, and design. Cell interconnection and module fabrication. Designing stand-alone and grid-connected photovoltaic systems. Special-purpose photovoltaic applications. Concentrator and hybrid solar thermal and photovoltaic systems. Advanced photovoltaic systems.

REE 547 - Electric Power Conversion
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Electric power conversion for wind generators. Review of power switching devices. Rectifiers, DC-DC converters, inverters. Pulse-width modulation. Converter topologies. Doubly fed induction generators. Reactive power compensation

REE 549 - Power System Protection/Contrl
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Protection systems overview; protective devices; coordination and sequencing of relays; grounding practices; impedance protection. Methods of power systems operation and control; load-frequency control, automatic generation control. Modeling power systems protection and control using power system analysis software, emphasizing renewable resources. Prerequisite: REE 529

REE 551 - Advanced Geothermal Energy
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Classification of geothermal resources. Basics of geothermal wells and drilling. Resource capacity estimation and measurement. System design and integration. Application such as aquaculture, greenhouses, and district heating.

REE 553 - Energy Systems Mgmt/Auditing
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Evaluating building thermal/electric/process loads, including lighting, hot water, HVAC and central plant systems, industrial refrigeration and motors. Opportunities for managing energy use through controls and operations/maintenance strategies. Roles of commissioning, energy auditing, renewables and economic analysis in reducing energy use.

REE 555 - Stationary Fuel Cells
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Advanced treatise of fuel cell systems for large, stationary applications with detailed examination of polymer electrolyte membrane, alkaline, phosphoric acid, molten carbonate, and solid-oxide systems, their design, performance, lifetime and reliability, modeling, and economics.

REE 557 - Costing Renewable Energy
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Renewable energy in micro-and macroeconomic contexts. Review and discussion of current energy market structures, prices, effects of inflation and incentives, affordability, costs of supply reliability, investment criteria, and modeling market trends.

REE 559 - Develop of Hydropower Proj
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Mechanical and electrical equipment, including flow control elements, generators, transformers, protection and control equipment, and governors. Transient responses and stability. The engineering, procurement and construction process for hydropower projects. Commissioning and documentation.

REE 561 - Process Desgn/Econ Eval f/BES
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Process engineering methods, including development of process and instrumentation diagrams (P&ID); equipment selection and sizing; cost estimation, economic evaluation, and fundamentals of chemical process safety.

REE 563 - Batteries
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Comprehensive overview, integration characteristics, and performance comparison of battery systems for transportation and stationary applications, including lead-acid, nickel metal hydride, nickel cadmium, sodium-sulfur, lithium polymer, and lithium ion.

REE 565 - Semiconductor Process Enginrng
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Semiconductor process technology; crystal growth, silicon oxidation, photolithography, etching, diffusions, ion implantation, film deposition. Process integration, manufacturing, and metrology. Future trends and challenges.

REE 567 - Wind Energy Systems Integratn
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Wind system electric power integration, protection, and control. System components, including generators, transformers, and switching stations. Network stability. Energy sector regulation and markets. Forecasting and integration of wind power systems.

REE 569 - Grid Integration of Renewables
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Issues unique to connecting renewable energy generation to the grid. Microgrids. Stability, transient, and harmonic effects. Interconnect agreements and requirements. SCADA and smart grid concepts. System optimization.
Prerequisite: REE 549

REE 571 - Geothermal Power Generation
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
High-enthalpy resources suitable for electric power generation. Energy transfer and conversion. Plant design and integration. Advanced design such as absorption power cycles.

REE 573 - Energy-Efficient Bldg Design
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Principles of integrated, energy-efficient building design. Interpretation/application of codes, standards. Use of software tools for modeling, simulation of building energy systems. Daylighting, natural ventilation, architectural features of passive solar buildings. Inclusion of renewable resources and net-zero designs. Life-cycle economic analysis.

REE 575 - Transportation Fuel Cells
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Detailed assessment of advances, prospects, and economics of polymer electrolyte membrane fuel cell, operational characteristics, durability, manufacturing, and fuel storage options in the automotive applications.

REE 577 - Renewable Energy Integration
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Discussion based-class on the integration of renewable energy into the established electric grid, focusing on energy availability, reliability, options for integration, matching demand, and balancing economic options on global, regional, and local scales.

REE 579 - Econ/Reg/Envir Aspects Hydrop
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Duration curves and generation studies. FERC permitting and licensing, including compliance. Power sales contracts and bundled services. Environmental impact assessments. Project financing, management, and operations requirements. Optimization of integrated hydropower systems.

REE 581 - Energy Storage Fundamentals
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
The survey course will examine energy storage fundamentals; applications and trends for pumped hydro, compressed air, flywheels, superconducting magnetic energy storage, gravitational mass, supercapacitors, batteries, fuel cells, and thermal systems.

REE 582 - Introduction to Batteries
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
The course provides introduction to field of batteries and discusses electrochemical fundamentals and general properties of batteries such as energy density, specific power, charging and discharging, temperature effects, aging, and self-discharge.

REE 583 - Intro to Fuel Cells
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
This overview course will introduce students to fundamental fuel cell principles, history, classification, thermodynamics, efficiency and causes of voltage losses, reaction kinetics, electrode performance and catalyst design, and fuel cell components and their impact on performance.

REE 591 - Hydrogen Prod & Storage
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
The course will discuss the basics of hydrogen production and storage, the concept of hydrogen economy, conventional hydrogen generation, electrochemical and photochemical technologies, principles of hydrogen storage and novel storage materials.

REE 592 - Advanced Batteries
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
This course will examine technology and trends in battery chemistry, manufacturing, pack assembly, characterization, safety, economics and applications for battery systems including lead acid, nickel-based,

lithium ion, lithium polymer, metal air and flow batteries.

REE 593 - Advanced Fuel Cells
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
This course provides in an in-depth analysis of the current trends, fuel processing, novel materials, applications, safety, and characterization for polymer electrolyte membrane, alkaline, phosphoric acid, molten carbonate, solid oxide, and direct methanol fuel cells.

REE 599 - Graduate Research or Project
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Graduate research leading to the completion of a master's thesis or project. Minimum of three terms required.
Prerequisite: Advisor consent

System Engineering and Technology Management

SEM 421 - Systems Engineering
Lecture Hours: 4
Lab Hours: 0
Credit Hours: 4
Foundations of Systems Engineering: Structure of Complex Systems; System Development Processes and Frameworks; System Engineering Validation, Reliability, Availability, Maintainability and Deployment; Human Factors Engineering.
Prerequisites: MATH 253 (or MATH 253N), or MATH 254 (or MATH 254N), or MATH 341, and WRI 227

SEM 422 - Advanced Systems Engineering
Lecture Hours: 4
Lab Hours: 0
Credit Hours: 4
Advanced concepts in systems science and systems engineering; modeling and mathematical methods for systems engineering; system simulation tools; optimization and decision analysis; case studies involving practical systems engineering integration of hardware, software, information, and human factor systems.
Prerequisites: MATH 243 or MATH 361 or MATH 465; and MGT 345 and WRI 227, or SEM 421

SEM 425 - Advanced Engineering Mgmt
Lecture Hours: 4
Lab Hours: 0
Credit Hours: 4
Competitive Strategic Frameworks (Porter, RBV, Delta); Strategic Execution Framework; Project Management (PMBOOK); Financial Management; New Product Development; Case Studies.
Prerequisite: MGT 345 or SEM 421

SEM 521 - Systems Engineering
Lecture Hours: 4
Lab Hours: 0
Credit Hours: 4
Foundations of Systems Engineering: Structure of Complex Systems; System Development Processes and Frameworks; System Engineering Validation, Reliability, Availability, Maintainability and Deployment; Human Factors Engineering.
Prerequisite: Graduate standing

SEM 522 - Advanced Systems Engineering
Lecture Hours: 4
Lab Hours: 0
Credit Hours: 4
Advanced concepts in systems science and systems engineering; modeling and mathematical methods for systems engineering; system simulation tools; optimization and decision analysis; case studies involving practical systems engineering integration of hardware, software, information, and human factor systems.
Prerequisite: Graduate standing

SEM 525 - Advanced Engineering Mgmt
Lecture Hours: 4
Lab Hours: 0
Credit Hours: 4
Competitive Strategic Frameworks (Porter, RBV, Delta); Strategic Execution Framework; Project Management (PMBOOK); Financial Management; New Product Development; Case Studies.
Prerequisite: Graduate standing

SEM 526 - Case Studies in Systems Engr.
Lecture Hours: 4
Lab Hours: 0
Credit Hours: 4
Much of modern civilization is defined by technical products and services. Case Studies in Systems Engineering examines challenges firms face in creating these highly complex products and services rapidly, accurately, and cost-effectively. Selected cases represent examples of failed, successful, and prototype systems that all defined the state of the art. Through analysis and group discussions, students will critically examine issues and approached presented in numerous case studies. Students will link their own critical analysis to Systems Engineering best practices.
Prerequisite: SEM 521

SEM 527 - Engineering Data Analytics
Lecture Hours: 4
Lab Hours: 0
Credit Hours: 4
Engineering Data Analytics introduces students to the technologies and methodologies needed for data-driven decision-making during all stages of product development. Students will learn how to analyze, process, and establish correlations using data from various engineering processes during the design phase, prototyping phase, and production & operation phase. Students will examine large data sets from smart homes, large-scale IoT (Internet of Things) applications, and IC design & manufacturing. Correlations will be established using linear regression, Anova, and other data relationship techniques. Students will use advanced software tools such as Tibco Spotfire and R toe analyze Big Data, establish correlations, and determine if processes are capable and in control. An introduction to machine learning and real-time streaming analysis techniques will also be discussed.
Prerequisite: Graduate standing or MATH 465

Sociology

SOC 107 - Seminar
Lecture Hours: 0
Lab Hours: 0
Credit Hours: 15
(Hours to be arranged each term.)

SOC 201 - Classical Sociol Theory
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Introduction to the early development of sociological theory. Works by Marx, Weber, Durkheim, Parsons and Goffman will be discussed in terms of their contribution to the discipline of sociology.

SOC 202 - Contemporary Soc Theory
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Theories on the social construction of self, social and population structures, gender inequality, global capitalism and deviance are explored in the context of contemporary social issues.
Prerequisite: SOC 201

SOC 204 - Intro to Sociology
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Survey of human relationships and interaction of organized groups and institutions in modern society. Emphasis on attitudes, values, beliefs, customs and change within our complex social structure.

SOC 205 - Current Health Issues
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
An introduction to the most pressing health issues in contemporary society, including aging, healthcare reform, cost of healthcare, and amenable mortality.

SOC 206 - Social Problems
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
A sociological exploration of contemporary social problems, including crime, illness, poverty, unemployment, immigration,

gender inequality, LGBT issues, and the environment.

SOC 207 - Seminar
Lecture Hours: 6
Lab Hours: 0
Credit Hours: 6
(Hours to be arranged each term.)

SOC 210 - Marriage & Family Living
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Personal problems of the married couple in everyday living with an emphasis on adult lifestyles, relationships, sexual roles, and attitudes, family planning, family finances, and divorce and remarriage.

SOC 225 - Medical Sociology
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Introduction to medical sociology and social-epidemiological research, covering social causes and consequences of health and illness, the practitioner-patient relationship, health behavior, and health care organization.

SOC 235 - Intro to Sustainability
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
An introduction to the history, theory and practice of sustainability. The focus is on human-environment interactions, highlighting how human agency can jeopardize our collective future, and how harm can be avoided through appropriate social, political, and legal action.

SOC 301 - Soc Science Research Methods
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Introduction to theory and methods of research in the social sciences, and interpretation of social science research.
Prerequisites: SOC 204 and SOC 225

SOC 302 - Soc Science Resrch Methods II
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Continuation of SOC 301 Social Science Research Methods: data collection, analysis, and development of social science research papers.
Prerequisite: SOC 301

SOC 304 - Criminology
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Analysis of criminal behavior from theft to homicide. Discussion of the definition of criminal behavior, varieties of crime and the criminal justice system.
Prerequisite: SOC 204

SOC 305 - Rural Health
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Advanced introduction to rural population health and health care. Topics include rural population health and health behavior, economic and social/structural issues, and health care delivery and reform.
Prerequisite: SOC 225

SOC 307 - Seminar
Lecture Hours: 0
Lab Hours: 0
Credit Hours: 15
(Hours to be arranged each term.)

SOC 315 - Juvenile Delinquency
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Introduction to trends and sociological theories of juvenile delinquency.
Prerequisite: SOC 204

SOC 325 - Global Population Health
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Introduces demographic methods and theories of population health, in addition to trends in fertility, mortality, morbidity, and aging both in the U.S. and internationally.
Prerequisite: MATH 111 or SOC 204 or SOC 225

SOC 335 - Hlth Inequal & Cult Competency
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Introduction to health inequality based on systematic social research. Provision of basic training on cultural competency and underrepresented populations' engagement with the health care system.
Prerequisite: SOC 225

SOC 345 - Aging and Society
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Aging and Society examines the aging process from a sociological perspective. The course explores socialization and development in health, education, economics, and families. Students will critically examine how aging is shaped by societie's influence on individuals, groups, and cohorts.
Prerequisite: SOC 204 or SOC 225

SOC 405 - Program Planning & Eval
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
In this course, health behavior and behavior change theories are introduced, critiqued, and utilized to provide theory-based examples of population health interventions.
Prerequisites: SOC 204 and SOC 225

SOC 407 - Seminar
Lecture Hours: 12
Lab Hours: 0
Credit Hours: 12
(Hours to be arranged each term.)

SOC 421 - Senior Project Preparation
Lecture Hours: 2
Lab Hours: 0
Credit Hours: 2
Selection of senior capstone research project and/or selection of externship site and goals for externship experience that meets industry needs.
Prerequisite: Population Health Management majors with Senior standing only

Spanish

SPAN 101 - First Year Spanish
Lecture Hours: 4
Lab Hours: 0
Credit Hours: 4
An introduction to elementary Spanish. A three-quarter sequence for beginners. Emphasis on vocabulary building, listening comprehension, phonetics, oral practice, and elements of grammar. Elementary readings and writings will be required.
Prerequisite: Taken in sequence or instructor consent

SPAN 102 - First Year Spanish
Lecture Hours: 4
Lab Hours: 0
Credit Hours: 4
An introduction to elementary Spanish. A three-quarter sequence for beginners. Emphasis on vocabulary building, listening comprehension, phonetics, oral practice, and elements of grammar. Elementary readings and writings will be required.
Prerequisite: Taken in sequence or instructor consent

SPAN 103 - First Year Spanish
Lecture Hours: 4
Lab Hours: 0
Credit Hours: 4
An introduction to elementary Spanish. A three-quarter sequence for beginners. Emphasis on vocabulary building, listening comprehension, phonetics, oral practice, and elements of grammar. Elementary readings and writings will be required.
Prerequisite: Taken in sequence or instructor consent

SPAN 107 - Seminar
Lecture Hours: 0
Lab Hours: 0
Credit Hours: 15
(Hours to be arranged each term.)

SPAN 201 - Second Year Spanish
Lecture Hours: 4
Lab Hours: 0
Credit Hours: 4
Intensive introduction to the language. Course aims at progressive development of fluency through extensive exposure to the

language in real situations. Comprehension-based approach.
Prerequisite: SPAN 103 or instructor consent; SPAN 201, SPAN 202, SPAN 203 taken in sequence or instructor consent

SPAN 202 - Second Year Spanish
Lecture Hours: 4
Lab Hours: 0
Credit Hours: 4
Intensive introduction to the language. Course aims at progressive development of fluency through extensive exposure to the language in real situations. Comprehension-based approach.
Prerequisite: SPAN 201 or instructor consent; SPAN 201, SPAN 202, SPAN 203 taken in sequence or instructor consent

SPAN 203 - Second Year Spanish
Lecture Hours: 4
Lab Hours: 0
Credit Hours: 4
Intensive introduction to the language. Course aims at progressive development of fluency through extensive exposure to the language in real situations. Comprehension-based approach.
Prerequisite: SPAN 202 or instructor consent; SPAN 201, SPAN 202, SPAN 203 taken in sequence or instructor consent

SPAN 207 - Seminar
Lecture Hours: 6
Lab Hours: 0
Credit Hours: 6
(Hours to be arranged each term.)

SPAN 307 - Seminar
Lecture Hours: 0
Lab Hours: 0
Credit Hours: 15
(Hours to be arranged each term.)

SPAN 407 - Seminar
Lecture Hours: 6
Lab Hours: 0
Credit Hours: 6
(Hours to be arranged each term.)

Speech

SPE 107 - Seminar
Lecture Hours: 0
Lab Hours: 0
Credit Hours: 15
(Hours to be arranged each term.)

SPE 111 - Public Speaking
Lecture Hours: 2
Lab Hours: 2
Credit Hours: 3
Public speaking with emphasis on content, organization, and speaker adjustments to various situations; dynamics of the speaker/listener interaction; and appropriate language usage. Includes informative, demonstrative, and persuasive speeches.

SPE 207 - Seminar
Lecture Hours: 6
Lab Hours: 0
Credit Hours: 6
(Hours to be arranged each term.)

SPE 307 - Seminar
Lecture Hours: 0
Lab Hours: 0
Credit Hours: 15
(Hours to be arranged each term.)

SPE 314 - Argumentation
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Examines argumentation as part of human interaction and inquiry. Explores arguing to gain adherence as a way of reasoning. Practice in public speaking, debate, ethics and critical thinking.
Prerequisite: SPE 111

SPE 321 - Small Group/Team Comm
Lecture Hours: 2
Lab Hours: 2
Credit Hours: 3
Provides instruction and experience in decision making through group processes designed to develop competent team leaders and participants. Participation in and evaluation of a variety of group communication exercises.
Prerequisite: SPE 111

SPE 407 - Seminar
Lecture Hours: 6
Lab Hours: 0
Credit Hours: 6
(Hours to be arranged each term.)

Statistics

STAT 201 Intro to Data Science
Lecture Hours:4
Lab Hours: 0
Credit Hours: 4
A general overview of the field of data science. An introduction to data storage, data types, descriptive statistics, and visualization. Basic relational database structure and data retrieval. Report generation. An introduction to programming logic for data scientists.

STAT 211 - Data Science Methods
Lecture Hours: 4
Lab Hours: 0
Credit Hours: 4
Retrieval, cleaning, transformation, and preparation of data for analysis. An introduction to Bayesian statistics and maximum likelihood estimation with an emphasis on computational efficiency for big datasets. Ethics.
Prerequisites: CST 126, MATH 252, and (MATH 243 or MATH 361)

STAT 395 - Junior Project I
Lecture Hours: 4
Lab Hours: 0
Credit Hours: 4
Team-based applications of data science with an emphasis on workflow and reproducible results.
Prerequisite: STAT 211
Corequisite: MATH 362

STAT 396 - Junior Project II
Lecture Hours: 4
Lab Hours: 0
Credit Hours: 4
Team-based applications of data science with an emphasis on workflow and reproducible results.
Prerequisites: MIS 275 and MATH 362
Corequisite: STAT 441

STAT 397 - Junior Project III
Lecture Hours: 1
Lab Hours: 0
Credit Hours: 1
Selection of a senior project that incorporates techniques from computer science, mathematics, statistics, and management. The project may be in one of the following three categories: application to another discipline, algorithmic/computational or theoretical.
Prerequisites: STAT 395 and STAT 396

STAT 405 - Advanced Methods in Data Science
Lecture Hours: 4
Lab Hours: 0
Credit Hours: 4
A selection of topics from modern data science techniques with a focus on relevant applied problems.
Prerequisites: CST 211 and STAT 442
Corequisite: STAT 467

STAT 412 - Regression & Times Series
Lecture Hours: 4
Lab Hours: 0
Credit Hours: 4
Examines an introduction to regression analysis with a focus on multiple linear regression. Topics include statistical inference, goodness of fit, diagnostics, criteria for choosing covariates, categorical predictors, and an introduction to analysis of time series data.
Prerequisite: MATH 362

STAT 413 - Categorical Data Analysis
Lecture Hours: 4
Lab Hours: 0
Credit Hours: 4
Introduces analysis techniques for categorical data. Measures of stochastic superiority, odds ratios, techniques for Likert data, Models for frequency arrays, goodness-of-fit tests, two-, three-, and higher-way tables, latent and logistic models will be presented.
Prerequisite: MATH 362

STAT 414 - Stat Methods in Epidemiology
Lecture Hours: 4
Lab Hours: 0
Credit Hours: 4
Examines the methods used in epidemiologic research, including the design of epidemiologic studies and the collecting and analysis of epidemiological

data.
Prerequisite: MATH 361

STAT 415 - Dsgn & Analysis of Experiments
Lecture Hours: 4
Lab Hours: 0
Credit Hours: 4
Examines the principles of experimental design; construction and analysis of completely randomized design, randomized block design and Latin square designs; covariates; factorial treatments, split plotting; random effects and variance components.
Prerequisite: MATH 362

STAT 431 - Sampling Methods
Lecture Hours: 4
Lab Hours: 0
Credit Hours: 4
Construction of sampling frames; estimation of means, total and proportions: sampling designs including simple random, stratified, cluster, systematic, multistage and double sampling; ratio and regression estimators; source of errors in surveys; capture and recapture methods.
Prerequisites: MATH 361 and MATH 362

STAT 441 - Statistical Machine Learning I
Lecture Hours: 4
Lab Hours: 0
Credit Hours: 4
An introduction to machine learning with an emphasis on statistical theory. Supervised (discriminative and generative models) and unsupervised learning for categorical and numerical outcomes. Model selection and assessment.

Prerequisites: (MATH 361 or MATH 465) and (MATH 254 or MATH 261 or MATH 341)

STAT 442 - Statistical Machine Learning II
Lecture Hours: 4
Lab Hours: 0
Credit Hours: 4
Deep learning including designing and fitting neural networks for a variety of datasets, including independent, sequential, text, image, and big. Reinforcement learning.
Prerequisites: MATH 451 and STAT 441
Corequisite: MATH 342

STAT 467 - Spatial Statistics
Lecture Hours: 4
Lab Hours: 0
Credit Hours: 4
Sampling, descriptive, estimation, and prediction methods for spatially correlated data.
Prerequisites: GIS 332 and MATH 362

STAT 495 - Senior Project I
Lecture Hours: 4
Lab Hours: 0
Credit Hours: 4
Research and write a statistical analysis plan for the senior project. This project incorporates techniques from computer science, mathematics, statistics, and management and may be in one of the following three categories: application to another discipline, algorithmic/computational or theoretical.
Prerequisite: STAT 397

STAT 496 - Senior Project II
Lecture Hours: 2
Lab Hours: 0
Credit Hours: 2
Implementation of a statistical analysis plan for the senior project. This project incorporates techniques from computer science, mathematics, statistics, and management and may be in one of the following three categories: application to another discipline, algorithmic/computational or theoretical.
Prerequisite: STAT 495

STAT 497 - Senior Project III
Lecture Hours: 2
Lab Hours: 0
Credit Hours: 2
Presentation and results from senior project. This project incorporates techniques from computer science, mathematics, statistics, and management and may be in one of the following three categories: application to another discipline, algorithmic/computational or theoretical.
Prerequisite: STAT 496

STAT 505 - Biostatistics I
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
This course focuses on the introduction of statistics and application of statistical methods to data most often seen by medical practitioners and researchers. This course provides an introduction to the collection and analysis of public health and health care data. Elements of statistical inference, probability distributions, sampling, confidence intervals, and estimation of means and rates are reviewed with emphasis on application and critical interpretation of the results.

STAT 515 - Epidemiology I
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
This course will serve as an introduction to the basic principles of epidemiology and the measures used in epidemiology, epidemiologic study design and analysis, and other topics that are important to an introductory understanding of epidemiology.

Vascular Technology

VAS 107 - Seminar
Lecture Hours: 0
Lab Hours: 0
Credit Hours: 15
(Hours to be arranged each term.)

VAS 207 - Seminar
Lecture Hours: 0
Lab Hours: 0
Credit Hours: 13
(Hours to be arranged each term.)

VAS 214 - Vascular Anatomy
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Detailed consideration of the gross and microscopic anatomy of arteries and veins throughout the human body. Laboratory includes cadaver dissection, anatomical models, and an introduction to instrumentation and basic ultrasound scanning techniques.
Prerequisite: MIT 103 with grade "C" or better

VAS 245 - Periphrl Venous Disease
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Investigation to the pathophysiology of venous disease with emphasis on theoretical and practical considerations of diagnostic methods of venous testing. These include clinical assessment, plethysmograph, and Duplex Imaging of lower extremity veins.
Prerequisite: VAS 246

VAS 246 - Perphrl Arterial Disease
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Investigation of the pathophysiology of arterial occlusive disease with emphasis on the theoretical and practical considerations of diagnosis methods of arterial testing. These include clinical assessment, physiological evaluation, and Duplex imaging of lower extremity arteries.
Prerequisite: VAS 214

VAS 307 - Seminar
Lecture Hours: 0
Lab Hours: 0
Credit Hours: 15
(Hours to be arranged each term.)

VAS 335 - Radiogrphc Vasclr Anat
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Survey of medical imaging modalities ancillary to vascular sonography including angiography, digital subtraction angiography, computerized tomography and magnetic resonance angiography. Student teams will prepare case studies comparing the efficacy of these imaging modalities.
Prerequisite: VAS 214 with grade "C" or better

VAS 337 - Survey of Echocardiography
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3

A survey of basic echocardiography with emphasis on normal cardiac anatomy and abnormal disease states. Standard sonographic imaging techniques of adult echocardiography, including instrumentation and protocols.
Prerequisites: BIO 220

VAS 365 - Abdominal Vasc Disease
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Diagnostic methods of abdominal and visceral vascular disease testing. Includes aorta-iliac, renal artery and kidney, mesenteric system, liver system and transplantations. Laboratory emphasizes advanced instrumentation and scanning techniques, patient interviews, clinical signs and symptoms, physical assessment and findings.
Prerequisite: VAS 246

VAS 366 - Spec Circulatory Problms
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Diagnostic methods of testing the efficacy of vascular surgical procedures and interventions. To include arterial bypass grafts, organ transplants, and dialysis access grafts. Venous and arterial mapping, upper extremity venous and arterial disease testing, IVUS, pseudo aneurysm treatment, and compartment syndrome will also be covered.
Prerequisite: VAS 365

VAS 367 - Cerebrovascular Disease
Lecture Hours: 3
Lab Hours: 3
Credit Hours: 4
Theoretical and practical considerations of diagnostic methods of testing arterial and venous diseases affecting the vasculature of the head and neck including the intracerebral vessels. Laboratory includes advanced instrumentation and scanning techniques, and instruction on patient interviewing, clinical signs and symptoms, physical assessment and findings.
Prerequisites: VAS 366 and VAS 375

VAS 375 - Survey Abdom Sonography
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
A survey of basic abdominal sonography with emphasis on normal abdominal anatomy and abnormal disease states. Standard sonographic imaging techniques of general abdomen, instrumentation, and abdominal protocols. Corequisite: VAS 365.
Corequisite: VAS 365

VAS 385 - Vascular Lab Mgmt
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Focus on human resource skills as necessary to manage a vascular laboratory. Includes the interview process, hiring and firing, as well as employee performance evaluation. Other topics will include reimbursement, licensure, accreditation and other management issues.
Corequisite: VAS 388

VAS 388 - Externship Preparation
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Review and summarization of key concepts in Vascular Technology. Focus is on patient care and interpersonal scenarios the externship student will likely face while in the hospital environment or independent vascular lab. Review and discussion of the Vascular Technology Externship Handbook.
Prerequisites: VAS 366 and VAS 375, both with grade "C" or better
Corequisites: VAS 367 and VAS 385

VAS 407 - Seminar
Lecture Hours: 0
Lab Hours: 0
Credit Hours: 12
(Hours to be arranged each term.)

VAS 420 - Vascular Tech Extern
Lecture Hours: 0
Lab Hours: 0
Credit Hours: 15
All B.S. students complete four terms (12 months) of clinical experience in Vascular Technology at an affiliated clinical site. Students work under the direct supervision of Registered Vascular Technologists and provide monthly log sheets and evaluation forms. Students prepare clinical case studies each term.
Prerequisite: All academic coursework in the Vascular Technology curriculum

VAS 420A - Special Vas Tech Extern
Lecture Hours: 0
Lab Hours: 22
Credit Hours: 8
This two term special externship is designed for the degree completion student. Students working in a clinical vascular setting will prepare clinical case studies as well as rotate through special imaging modalities.
Prerequisites: Be an ARDMS or CCI Registered Vascular Technologist in good standing, and have completed academic course work in the Medical Imaging curriculum with grade "C" or better

VAS 420B - Special Vas Tech Extern
Lecture Hours: 0
Lab Hours: 18
Credit Hours: 7
This two term special externship is designed for the degree completion student. Students working in a clinical vascular setting will prepare clinical case studies as well as rotate through special imaging modalities.
Prerequisites: Be an ARDMS or CCI Registered Vascular Technologist in good standing, and have completed academic course work in the Medical Imaging curriculum with grade "C" or better

Writing

WRI 107 - Seminar
Lecture Hours: 0
Lab Hours: 0
Credit Hours: 15
(Hours to be arranged each term.)

WRI 115 - Introduction to Writing
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Focuses on sentence structure, paragraph coherence, and essays. Regular writing and feedback develop student competency in college level writing. May not be used to meet general education requirement or graduation credit.
Prerequisite: Writing ability as demonstrated by SAT/ACT score and/or writing sample

WRI 121 - English Composition
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Introduces critical reasoning and analysis. Explores connections between thesis, structure, tone and purpose; includes writing process, rhetorical strategies applications. Focuses on academic reading, writing and research skills.
Prerequisite: Writing ability as demonstrated by SAT/ACT score and/or writing sample

WRI 122 - Argumentative Writing
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Designed to develop skills in ethical argument, research, and critical thinking. Multi-page papers, including argumentative research paper, required. Focuses on writing process with attention to audience, effective style, writing process with attention to audience, effective style, and overall rhetorical effect.
Prerequisite: WRI 121 with grade "C" or better

WRI 123 - Research Writing
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Focuses on the formal research paper, including research techniques and process of developing a longer document.
Prerequisite: WRI 122
Pre- or Corequisite: SPE 111

WRI 207 - Seminar
Lecture Hours: 6
Lab Hours: 0
Credit Hours: 6
(Hours to be arranged each term.)

WRI 214 - Business Correspondence
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Focuses on theories and strategies

governing written correspondence.
Designed to equip the student to perform effectively in a variety of business writing situations; major emphasis on practical applications.
Prerequisite: WRI 122 or equivalent

WRI 216 - Public Relations Writing
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Students will be introduced to the basics of writing and designing public relations communication, including press releases, newsletters, brochures, and other written public relations communication tactics.
Prerequisite: WRI 122

WRI 225 - Writing Nonfiction
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Study of strategies for nonfiction composition. Both creation of text and analysis of existing text to apply the principles of effective nonfiction prose. Practical steps, techniques, and best practices geared toward analyzing, creating, organizing, revising effective nonfiction prose for publication. Significant amount of time spent writing and editing.
Prerequisite: WRI 122 with grade "C" or better

WRI 227 - Technical Report Writing
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Focuses on techniques of gathering, organizing, and presenting technical information and graphics. Requires technical reports derived from realistic situations in the student's major.
Prerequisite: WRI 122 with grade "C" or better
Pre- or Corequisite: SPE 111

WRI 305 - Writ for the Marketplace
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Designed to introduce the basics of professional writing- fiction, personal experience, and technical articles, etc. for publication, including marketing and manuscript preparation. Each student must submit at least one article or story (8 pages or more) for publication during the term.

WRI 307 - Seminar
Lecture Hours: 0
Lab Hours: 0
Credit Hours: 15
(Hours to be arranged each term.)

WRI 327 - Advanced Tech Writing
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Processes involved in technical writing and methods of preparing technical data; offers a variety of writing problems to provide opportunities for the student to develop precision in statement and in graphic presentation.
Prerequisite: WRI 227

WRI 328 - Style
Lecture Hours: 2
Lab Hours: 3
Credit Hours: 3
Focuses on developing strategies for diagnosing, analyzing, and revising clarity using the technical vocabulary of style. Approaches style as a rhetorical concern dependent on audience and other aspects of the situation. Applicable to both research and professional/technical writing.
Pre or Corequisite: WRI 227

WRI 332 - Academic Writing in the Disciplines
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Focuses on research and analytical writing strategies for meeting the rhetorical demands of specialized subjects and diverse audiences in the students' disciplines. The course addresses topics and issues of interest in disciplinary areas of health sciences, engineering, and social sciences.
Prerequisites: WRI 121 or WRI 122, and WRI 227 or WRI 327

WRI 345 - Science Writing
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Processes and strategies involved in communicating scientific information to professional and lay audiences, including: topic, hypothesis, and experimental method description; literature review strategies; writing and project management strategies; visual display of quantitative data.
Prerequisite: WRI 123 or WRI 227

WRI 350 - Documentation Develop
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Provides students with basic tools for preparing documentation. Focuses on usability of documentation and includes planning and scheduling, audience evaluation, use of appropriate examples and illustrations, style, editing technique, organization and research.
Prerequisite: WRI 227

WRI 407 - Seminar
Lecture Hours: 6
Lab Hours: 0
Credit Hours: 6
(Hours to be arranged each term.)

WRI 410 - Proposal & Grant Writing
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Provides theory and skills in proposal writing for seeking funding from public and private agencies and for preparing proposals in business and industrial settings. Focuses on the process of preparing proposals, including analyzing audiences, conducting research, organizing, writing, and editing.
Prerequisite: WRI 227

WRI 415 - Technical Editing
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Focuses on the role of the technical editor in business and industry. Examines the publishing process, the dynamics of the editor/writer relationship, and mechanics and techniques of proofreading and copyediting. Provides considerable practice in copyediting and proofreading manuscripts.
Prerequisite: WRI 227 or appropriate work experience

WRI 420 - Document Design
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Applies publishing and graphic arts principles to the preparation of professional publications and oral presentation materials. Includes typography, design principles, the use of graphical elements, and integration of text and graphics.
Prerequisites: SPE 111 and WRI 227

WRI 425 - Advanced Composition
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Advanced writing in varied topics specific to disciplines and realistic assignments in professional writing. 30 to 40 pages of formal writing required with several long pieces designed for publication. Open to advanced students in a variety of majors.
Pre or Corequisites: COM 301 or COM 305, and WRI 328

WRI 507 - Seminar
Lecture Hours: 12
Lab Hours: 0
Credit Hours: 12
(Hours to be arranged each term.)

WRI 510 - Grant Proposal Writing
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
This Provides theory and skills in proposal writing for seeking funding from public and private agencies and for preparing proposals in business and industrial settings. Focuses on the process of preparing proposals, including analyzing audiences, conducting research, organizing, writing, and editing.

WRI 521 - Writing at the Grad Level
Lecture Hours: 3
Lab Hours: 0
Credit Hours: 3
Focuses on developing professional-level writing skills to produce a master's thesis/project documentation. Includes structure, methodology, and emphasizes

adherence to OIT manual and appropriate reference style. By the end of term, students will have written a detailed prospectus and literature review.

Offices and Services

Administrative Offices (services may vary by campus location)

Educational Partnerships and Outreach

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outreach@oit.edu
www.oit.edu/academics/educational-partnerships

Oregon Tech's Office of Educational Partnerships and Outreach cultivates and maintains partnerships with area high schools, community colleges, and universities that result in increased access and smooth transitions for students. The office forges meaningful relationships with educational partners by connecting faculties, coordinating partnerships, participating in pathways and other local and statewide advisory boards and providing internal and external communication and promotion of partnerships. The office develops dual enrollment agreements with college and university partners, coordinates dual credit and other programs with high schools locally and statewide, manages and coordinates articulation agreements, and develops and manages other academic agreements. EPO is committed to promoting access and equity of higher education to students throughout the state, via their dual credit programming and post-secondary pathway work.

Information about the work of Educational Partnerships and Outreach, dual enrollment with colleges and universities, dual credit with high schools and specific articulation agreements are available on the web page or by contacting the office.

High School Programs for College Credit

(541) 885-1844 Klamath Falls
(503) 821-1297 Portland-Metro
www.oit.edu/dual-credit
www.oit.edu/hst

Dual Credit Program
The Dual Credit Program is a partnership between Oregon Institute of Technology and the participating high school to offer qualified high school students the opportunity to receive college credit from Oregon Tech. Oregon Tech is partnered with more than 150 high schools and offers more than 25 introductory college courses. The Dual Credit Program consists of college courses taught in the high schools by college level qualified high school instructors. These courses are offered as part of the regular high school curriculum with the option of registering for college credit from Oregon Tech. Dual Credit provides students with the opportunity to take college level courses, gain valuable skills, and develop study habits for college. Oregon Tech's dual credit programming adheres to the Oregon Standards for Dual Credit and Sponsored Dual Credit.

Early OWLS Program
The Early OWLS Program (EPO) at Oregon Institute of Technology gives qualified high school students the opportunity to come to the Klamath Falls or Portland-Metro campus and take a college course for Oregon Tech credit. Students must be 14 years or older and are typically eligible to take 100- and 200-level courses. High school students must register through the Office of Academic Agreements.

The Dual Credit and HST Programs allow Oregon Tech to reduce the normal tuition fee by a considerable amount. Cost to the participating high school student is $100 per class for Dual Credit, and $25 per credit for EPO.

Affirmative Action, Non-Discrimination and Equal Opportunity

Office of Human Resources, Snell 108
(541) 885-1108

The Civil Rights Officer is charged with oversight and enforcement of Oregon Tech's compliance with relevant federal, state and university civil rights statutes, regulations and policies. Complaints and grievances related to unlawful discrimination and harassment under federal and state Civil Rights Acts, the Rehabilitation Act, the Americans with Disabilities Act, and other federal or state anti-discrimination and employment laws are to be directed to the Officer for resolution. The Officer also coordinates Oregon Tech's Equal Opportunity programs and activities which seek to maintain a learning and working environment that fosters diversity, inclusion and personal success. Inquiries, requests for assistance, or grievances pertaining to Oregon Tech policies on discrimination, harassment, equal opportunity or access to programs and services should be directed to this office.

Assessment

(541) 885-1990
www.oit.edu/faculty-staff/provost/academic-excellence/GEAC/essential-studies/eslo

Oregon Tech actively engages in assessment of both degree programs and broad institutional essential student learning outcomes (ESLOs). The Director of Academic Excellence and Executive Assistant, in conjunction with the Executive Committee of the Assessment Commission, leads the campus in these efforts. Assessment plans are developed for each undergraduate and graduate degree program focusing on program learning outcomes created by each academic department. The faculty for the program identify strengths and weaknesses in student learning and recommend plans for improvement through a continuous program improvement process. Information on assessment of student learning outcomes is posted on the Oregon Tech website. Oregon Tech faculty members also assess the ESLOs, which are intended to reflect common themes from departmental and program learning outcome statements. Information on assessment of ESLOS is posted on the Oregon Tech website at www.oit.edu/faculty-staff/provost/academic-excellence/GEAC/essential-studies/eslo.

Campus Safety

Cornett 231
(541) 885-1111
www.oit.edu/safety

The Campus Safety department administers the university's security and parking programs. The department promotes security on the Oregon Tech campus through emergency and non-emergency response services, problem solving, and enforcement of appropriate laws, rules and regulations. The Campus Safety department also provides service functions such as crime prevention and crime reporting programs. Campus Safety patrol officers are available 24/7 for any concern, including disability issues that need immediate resolution or assistance. Our "Night Ride" assistance program is also available for any person that needs an escort from one area to another on campus 24/7.

Geo-Heat Center

Boivin Hall, 102
(541) 885-1750
geoheat@oit.edu
www.oit.edu/orec/geo-heat-center

The Oregon Renewable Energy Center encompasses Oregon Tech's Geo-Heat Center. Established in 1975, Geo-Heat is active in research, technical assistance and information services in geothermal direct-use, small-scale power generation and ground-source heat pumps. Research activities have included hydrology and geochemistry studies, district heating, down hole heat exchangers, heat pumps, agri-business applications, low temperature Rankine cycle power generators and resource assessment.

As funding allows, the Center provides technical assistance for geothermal projects in the area of equipment and materials selection, feasibility studies, design, troubleshooting and economic evaluations. The Center also provides training sessions and information dissemination regarding the direct applications of geothermal energy, small-scale power generation and ground-source heat pumps.

The Center also publishes technical papers, software and monographs on geothermal energy. Most publications are available on the Center's website, and also through the National Geothermal Data System (NGDS). Archival publications are available through Oregon Tech's library system. The staff has made presentations worldwide and gives tours of local geothermal installations. They are active in professional organizations such as the Geothermal Resources Council, the International Geothermal Association, International Ground-Source Heat Pump Association, and ASHRAE. An extensive Web site on geothermal energy is available at: www.oit.edu/orec/geo-heat-center

Information Technology Services

(541) 885-1720
(541) 885-1470 Helpdesk/Service
(503) 821-1289 Portland-Metro Helpdesk

Information Technology Services provides computing and telecommunications resources for the Oregon Tech campuses. Primary service and support areas include e-mail and network storage for all students, faculty and staff; broadband network connectivity between all Oregon Tech buildings; and advanced technology services such as wired and wireless Internet connections, Internet 2 and interactive videoconferencing. In conjunction with Oregon Tech faculty, staff and students, ITS strives to offer the comprehensive and advanced technologies necessary to meet educational needs and to help facilitate instruction and research on the Oregon Tech campus.

Oregon Tech offers more than 500 computers available for student use on the Klamath Falls campus. The Portland-Metro campus is a laptop-required campus with resources like laptop specifications, financial aid, and helpful instructions found at www.oit.edu/portland-metro/college-costs/bring-your-own-device. ITS supports the computers and projectors in campus laboratories and classrooms to insure proper function and availability for faculty and students.

Library Services

(541) 885-1772
www.oit.edu/libraries

The University Libraries consist of the main library on the Klamath Falls campus, the Shaw Historical library, and the Portland-Metro campus library. The online catalog provides access to the library collections, while web-based databases offer students access to extensive online information sources. All electronic resources are available on both campuses and via remote access in order to promote student learning regardless of location. Research services include print and electronic reserves, inter-library loans, individual research assistance, and chat reference. Campus librarians offer class-related instruction in the use of the library and information resources, workshops on various topics, classes in research methods, and tours.

Klamath Falls Library
The Klamath Falls library, located on the first and second floors of the Learning Resources Center (LRC), contains print and electronic research materials, including government documents; access to thousands print and electronic journals; and unique digital and special collections. For librarian assistance, call (541) 885-1772 or email libtech@oit.edu.

Portland-Metro Library
The Portland-Metro library, located on the fourth floor of the Portland-Metro campus building, houses a print collection on-site focusing on local programs, and will request any other resources as needed. For assistance call (503) 821-1260 or email libtech@oit.edu.

Shaw Historical Library
The Shaw Historical Library, located on the second floor of the LRC, established in 1983 by Laurence and Dorothy Shaw, houses books, art, maps, manuscripts, photographs, and other materials on the history, cultures and natural history of the Land of the Lakes—South Central Oregon, Northern

California, and Northwestern Nevada. The Journal of the Shaw Historical Library is available for purchase at the Oregon Tech bookstore. For more information call (541) 885-1686 or email Shawlib@oit.edu.

Marketing, Communications & Public Affairs

Snell Hall (Klamath Falls)
(541) 851-5480
2nd Floor, Administrative Wing (Portland-Metro)
(503) 821-1303
marketing@oit.edu

The Marketing, Communications and Public Affairs Department (MarCoPa) at Oregon Tech is responsible for developing and implementing integrated outreach strategies designed to advance the university's reputational capital and standing among a variety of constituents and audiences. This includes providing services to all segments of the university, from supporting academic departments in promoting their programs, to developing ad campaigns for student recruitment, to creating communications strategies that undergird our mission.

The department is responsible for the university's brand position and identity. It works with academic programs and administrative departments throughout the university on marketing and advertising outreach efforts, and manages university-wide publications, video production, the university's website, and social media. The department also serves as the public affairs office for the university, managing media relations, supporting legislative affairs, and providing executive communications and editorial support.

Oregon Renewable Energy Center

The Oregon Renewable Energy Center (OREC) was established by the Oregon State Legislature in 2001 to promote energy conservation and renewable energy use in Oregon and throughout the Northwest. This is accomplished through applied research, educational programs and workforce development, and technical assistance and information dissemination. The Center also encompasses Oregon Tech's Geo-Heat Center. OREC draws its strong technical expertise from the Oregon Tech faculty, whose engineers and computer scientists have been involved in applied research in renewable energy for decades.

OREC:

- investigates renewable energy technologies and opportunities for using them
- assesses which technologies are appropriate for particular circumstances
- applies promising technologies with effective instrumentation and controls
- evaluates technologies using testing and economic analysis
- supports Curriculum Development and student learning experiences
- informs the public through classes, educational materials, and technical data

Current OREC applied research and applications engineering projects focus on:

- power conversion and storage – Testing renewable technologies such as solar, fuel cells, and geothermal heat pumps and developing control systems to smoothly integrate renewable technologies into existing facilities and electrical distribution networks
- alternative fuel sources – Investigating electric and biodiesel power options for cars and trucks
- green building technologies – Utilizing green building materials and techniques, and instrumentation, control and testing of buildings that use renewable energy instead of conventional power
- grid integration of renewable energy sources (smart grid with smart buildings)

Pre-College Programs

www.oit.edu/academics/pre-college-programs

Oregon Tech's Youth Programs offers innovative and energizing pre-college educational outreach programs designed to encourage K-12 students to pursue educational and career goals in science, technology, engineering and mathematics (STEM). The goals of our programs are to:

1. increase understanding and interest in STEM careers among participants
2. build confidence in their technical abilities
3. introduce them to role models and mentors

Pre-College Camps

SUMMER STEM PROGRAMMING

SUMMER STEM offers day and residential camps each summer designed to be an inclusive learning environment for young scholars to experience STEM education across multiple avenues in a collegiate setting. Curriculum varies each summer with multiple academic departments leading experiences. Young scholars have participated in activities ranging from bridge building simulations (Civil Engineering), to soap making (Chemistry), to coding Arduino systems, and understanding and experimenting with food psychology. Scholars are provided with field trips that highlight STEM in real life and share conversations with industry experts and thought leaders from a variety of STEM fields.

Registrar's Office

Snell, Lower Level
(541) 885-1300
registrar@oit.edu
www.oit.edu/registrar

Major functions of the Registrar's Office are the maintenance of student records, registration, Web services, grade processing, transfer credit evaluation and community college articulation, degree checking, graduation, scheduling, veterans' services, enrollment certification and the catalog.

Academic Information
The class schedule, introductory pages to the Class Schedule and General Catalog contain information about academic regulations, registration instructions and college procedures and policies. Students should be familiar with this information. These documents can be found on the Oregon Tech Web site at www.oit.edu/registrar.

Student Records
The Registrar's Office maintains information regarding academic progress, including grade reports and permanent academic records (transcripts). Students and alumni may request transcripts at any time.

The Registrar's Office also collects and maintains accurate information about students, such as address, curriculum (major) and advisor's name. Much of this information is required for local and state enrollment reporting and for accurate mailing addresses. Changes to personal data such as address or name should be reported to the office promptly.

Privacy Rights
Under the Family Educational Rights and Privacy Act of 1974, students are entitled to review records, files, documents and other materials that contain information maintained by the university. Students may challenge information considered inaccurate or misleading. A list of university records, the responsible custodians and the university policy on records are available in the Registrar's Office.

Directory Information
The following information is considered Directory Information and may be made available to the public unless you restrict its release by written notice to the University Registrar by the last day to register or add courses for the current term.

Oregon Tech designates the following items as Directory Information: student name, current address, current telephone number, dates of attendance, classification (year in school), major field of study, most recent previous school attended, degrees and awards received (including dates), hometown, past and present participation in officially recognized activities and sports; and for members of athletic teams: age, height and weight.

Registration
The Registrar's Office publishes the class schedule and registration instructions for each term on the Oregon Tech Web site at www.oit.edu/registrar. It also maintains class rosters for instructors and processes grades. Personal information, class schedules and grades, as well as unofficial transcripts, are on Oregon Tech's Web for Student and also available in the office.

Strategic Partnerships and Government Relations

Portland-Metro
(503) 821-1247
www.oit.edu/strategic-partnerships

The Office of Strategic Partnerships (OSP) and Government Relations promotes and oversees industry and government relationships at the Oregon Institute of Technology. The staff is responsible for campus-wide promotion of the University's economic development mission by facilitating the external relationships that enable the University to contribute to the vitality of its campus regions and the state of Oregon.

The OSP has responsibility for:

1. building long-term partnerships with businesses and industry associations that are crucial to Oregon Tech's mission
2. providing support to secure external funding by leveraging private sector partnerships for grants and sponsored projects
3. proactively working with faculty to develop collaborations with industry that lead to sponsored projects, commercialization and entrepreneurial opportunities
4. building an alliance of local, state and national support for Oregon Tech's policy and funding priorities
5. representing the University on strategic partnerships, industry affairs, and legislative advisory councils

The OSP collaborates with the Office of Sponsored Projects & Grants Administration and the Office of Innovation and Technology Transfer to determine Oregon Tech's research priorities and align faculty research interests with industry, other universities, and economic development and research organizations. Operationally, the Office of Strategic Partnerships reports to the President to advance the University's strategic priorities.

Business and Industry Partnerships
The Office of Strategic Partnerships assists Oregon Tech's faculty at all locations to connect to industry partners and advisors to ensure that Oregon Tech's courses integrate new technologies and are responsive to business needs for skilled professionals. Businesses throughout the Pacific Northwest, such as Intel, Pacific Power, Maxim, PCC Structurals, FLIR, Mentor Graphics, JELD-WEN, Kaiser, Providence and the Boeing Company, send their best and brightest to Oregon Tech for professional development so they can advance into engineering, technology, health care and management positions within their companies.

Oregon Tech's business partners participate on Industry Advisory Councils, support students through internships and sponsored student projects, teach as adjunct faculty, recruit graduates for jobs, donate labs and equipment, and sponsor applied research. Oregon Tech could not fully execute its mission without the engagement and support of industry partners.

Oregon Tech is a member or partner with the Smart Grid Oregon, Drive Oregon, Oregon Solar Energy Industry Association, Renewable Northwest Project, Oregon Manufacturing Innovation Center, Oregon BEST (Built Environment & Sustainable Technology), Manufacturing 21 Coalition, Pacific Northwest Defense Coalition, Gorge Technology Alliance, Technology Alliance of Oregon, Oregon Manufacturing Extension Partnership, Oregon Workforce Investment Board and several local workforce boards, Oregon Transportation Research and Education Consortium, Oregon Health care Workforce Institute, and the Greater Portland, Klamath Falls, Tualatin, and Wilsonville Chambers of Commerce.

Government Relations
Oregon Tech's government relations activities support the university community's vision "Oregon Tech will be a nationally recognized public polytechnic university delivering in-demand, industry-focused degrees and graduates ready to meet workforce needs in Oregon and the Northwest."

Working with local, state and national elected and appointed leaders, Oregon Tech's government relations efforts are focused on enhancing student and graduate success, continuing excellence in applied degree programs, providing statewide educational opportunities, advocating for state funding for educational resources and capital projects, and increasing service to the community.

Oregon Tech provides information to local, state and national legislators and policy makers on:

- increasing access for rural and under-served students to science, technology, engineering and math (STEM) degree programs
- workforce development support for local industries, such as health care, energy, and manufacturing
- education policy and reform including Oregon Tech's initiatives to achieve the state's and nation's educational goals
- financial aid and student access initiatives, with a focus on rural students and first-generation college students
- re-authorization bills that impact Oregon Tech's portfolio of programs
- local, state, and federal competitive grants to enhance Oregon Tech's degree programs and net-zero campus initiatives

Title IX

Title IX Office, Snell 108
(541) 885-1108
titleix@oit.edu

The Title IX Coordinator is charged with oversight and enforcement of Oregon Tech's compliance with Title IX of the Education Amendments. Complaints of gender-based or sex-based discrimination, sexual harassment, and sexual assault should be immediately reported to Oregon Tech's designated Title IX Coordinator.

Auxiliary Services (services may vary by campus location)

Athletics, Recreation and Fitness

(541) 885-1634
oregontechowls.com

The mission of the Oregon Tech Athletic Department and the TechRec Center is to facilitate growth and development of students. The department provides a broad-based athletic program that creates educational opportunities through the medium of competition at the collegiate level as well as the opportunity to benefit personal health and fitness to the campus community through the TechRec Center (Student Fitness Center) and educational classes. Oregon Tech's Athletics, TechRec Center has many facilities, fitness and education opportunities. A free-weights room stocked with all the needed equipment is located downstairs on the east side. An eight-lane, 400-meter, all weather surface track and a lighted basketball court offers more outdoor recreation. Also, watch for a lawn volleyball net as it tends to move around campus. Oregon Tech competitive athletics teams include men's and women's basketball, cross country, soccer, golf, track and field; women's volleyball, women's softball, and men's baseball. Tech also supports men's and women's Rugby programs as extramural sports.

The TechRec Center, Athletics, Intramural Sports, and Extramural Sports are funded by sales revenue (tickets, concessions, camps etc.), Incidental Fees, Oregon State Lottery funds, State General Appropriations, and contributions from the community through the Oregon Tech Foundation.

Competitive Athletic Teams
The Oregon Tech Athletic department is dedicated to preparing our student-athletes for professional and personal success in the real world by learning the values of integrity and excellence on the court, field, and in the classroom. To that end, we are committed to field teams with the talent and ability to compete at the top of the Cascade Collegiate Conference, as well as regionally and nationally in the NAIA while representing Oregon Tech with dignity and class. To date, Oregon Tech has brought home five NAIA National Championships in team sports – men's basketball in 2004, 2008 and 2012; softball in 2011, and women's cross country in 2018. The privilege of participation in intercollegiate athletics and dedication to team goals provides a classroom where students may experience the development of skills, sportsmanship, loyalty, self-discipline, and responsibility while learning the values of winning, losing, and competing. The Oregon Tech athletic program contributes to campus life by providing a focal point for social interaction, leadership development, involvement in peer support groups, and entertainment.

Intramural Sports
The Oregon Tech intramural program offers a variety of individual and team events in three divisions: men, women, and co-ed. We hope that our program and its diversity will invite each of you to participate in at least one event during the academic year. Call (541) 885-1634 for information about intramural sports programs or see the website for rosters and information.

TechRec (Student Fitness Center)
TechRec is a newly renovated student fitness center that will reopen summer 2020. For more information about workout facilities available to students, please call (541) 885-1634.

Bookstore, Tech Nest

College Union, 1st Floor
(541) 885-1050
bookstore@oit.edu

The Tech Nest Bookstore is a full-service campus bookstore that offers a variety of textbook and course material options (purchasing new or used, rental, and digital). In addition to these textbook options, they also offer a price match program, matching prices with online retailers: Amazon, and Barnes & Noble (see store for full details). They also carry a wide variety of supply and accessory items: school, office, dorm supplies, scientific calculators, writing instruments, emblematic clothing and gifts, computer supplies, useful reference books, and others. The Tech Nest also has a book buy-back program that allows students to sell back books at the end of the term.

Online ordering is available through the bookstore website at oregontech.bncollege.com/shop/oit/home. You can place an order to pick up in store or have the item(s) shipped to you. The website allows students to order from the items in-store and a wide variety of other items for campus life, which are

available only online. Students can also set up a revolving charge account at the bookstore, allowing students to make purchases using their student ID (see store or Cashier's Office for full details).

The Tech Nest also has a book buy-back program that allows students to sell back books at the end of the term. Unlike other programs, students can sell back books every day as opposed to one time each term. The Tech Nest also sells mailing supplies such as stamps and packing materials, and packages can be shipped via Federal Express from the store.

Campus Dining

College Union, 2nd Floor
(541) 885-1076
oit.sodexomyway.com

Dining services, provided by Sodexo Inc., offer a dining program complete with services in several locations across campus, and menu selections that include just about every item you can imagine.

The Marketplace features a wide variety of fresh food designed to satisfy everyone's appetite with food choices to rival restaurant favorites. The Bistro is a quick-serve coffee/espresso and light meals venue located on the first floor of the College Union. Duffie's, located in the Purvine building, offers a variety of fresh items to get you going in the morning or for a quick pick-me-up between classes. The Night Owl, the residence hall snack bar, is open only at night and offers a selection of beverages and snacks to satisfy that late night hunger.

Document Resource Center

College Union, 1st Floor
(541) 885-1894
servicecenter@oit.edu

The DRC is a one-stop shop for printing and bulk mailing needs. Services are available to faculty, staff, and students.

Black and white, color, digital printing, as well as laminating, comb binding and gluing are available at low costs. Electronic job submission provides the campus with access to services and completed jobs can be delivered to campus mailboxes within 24 hours.

Mail services include bulk mailing; mail merge; folding and inserting; and postcard mailings. Special requests will be addressed on an individual basis. Hours of operation are 7 am to 5 pm Monday through Friday.

Housing and Residence Life

Housing Office Residence Hall, A151
(541) 885-1094
housing@oit.edu
www.oit.edu/campus-life/housing

Housing and Residence Life encourages self-responsibility, a necessary ingredient for the accomplishment of academic, social, and personal objectives. Every attempt is made to provide an environment to accomplish this aim. Oregon Tech's Housing and Residence Life program provides a vital aspect of a student's educational experience, from support in the classroom to extracurricular activities designed to supplement in class learning. Emphasis is on providing accommodations that are attractive, safe, reasonably priced, and that offer stimulating programs that satisfy individual needs for privacy, community life, diversity in living arrangements, and educational growth. In the Housing Office, students can plan for a room, receive assistance with personal matters, consult with staff, make suggestions for improvements, discuss financial issues, and receive assistance for a variety of housing related concerns and interests.

Residence facilities at Oregon Tech are operated on a self-supported financial basis. Living on campus relieves the student of many time-consuming and expensive tasks, including driving to and from campus and preparing meals. With this extra time and financial savings, students can devote more energy to their studies, participate in non-academic learning experiences, and enjoy recreational and stress-relieving pursuits, making new and often lifelong friends.

Information about on-campus housing is sent to all students admitted to Oregon Tech. Students living on campus must sign up for the meal plan. Apply now to live on campus with us. Visit our webpage at www.oit.edu/campus-life/housing, click on Apply Now, and follow the 5 steps to apply for on campus housing!

Completed applications for on-campus housing received in the Housing Office by May 1st are guaranteed a space on campus for the upcoming academic year.

Room-and-Board Rates
Room-and-board rates at Oregon Tech are announced publicly after university approval. Current rate information and any other information concerning Housing can be obtained from the Housing and Residence Life Office, Oregon Tech, 3201 Campus Dr., Klamath Falls, OR 97601-8801, or online.

Student Services (services may vary by campus location)

Campus Life

College Union 107
(541) 885-1829
www.oit.edu/campus-life

Campus Life is where students connect! We support the meaningful growth and development of Oregon Tech students throughout the life of their university experience. Through active partnership with our students, opportunities are created for hands-on learning, self-discovery, leadership, teamwork, diversity, community service, and social justice in an environment that is rewarding, energetic, and fun.

Campus Life oversees the following resources and areas:

Community Service

Campus Life has information available to connect students to ongoing service projects with local agencies in Klamath Falls. The department also coordinates monthly projects that take place on campus and in our local community. In addition, we sponsor annual spring break and summer break service trips and take a group of students to serve outside of our local area. Join the mobile community and find out how to serve at www.noblehour.com/oregontech.

Family and Alumni Weekend

Family and Alumni Weekend is open to all Oregon tech students, faculty, staff, alumni, and their families! Bring your children, siblings, parents, grandparents, partners, and friends and join us for the weekend!

Leadership Development

Through the Leadership Academy, Campus Life provides an opportunity for students to integrate a variety of experiences across campus into their leadership development. The program includes opportunities for student development in the areas of communication; teamwork & service; diverse perspectives; wellness; professional development; and campus life. The workshops are free and open to all students.

Week of Welcome (NSO)

New Student Orientation's Welcome Week is held each year immediately preceding fall term classes. It is designed to help new students acclimate to Oregon Tech, meet their fellow students, and feel ready for the start of a successful year. The events range from social mixers to small-scale activities to informational sessions, and many meal sharing opportunities. All incoming students are welcomed with Oregon Tech gear. Any student who begins in winter and spring terms are encouraged to stop by Campus Life to receive their gear, learn about how to get connected, and enjoy a personal welcome from the staff.

Registered Student Organizations (RSOs)

Student clubs and organizations add another important dimension to life on campus. Almost half of the approximately 60 clubs are related to various academic disciplines and provide opportunities for students to meet, study, and take part in professional development opportunities such as conferences and competitions related to their majors. Clubs and organizations also work together to support service learning by participating in a variety of community service projects at home and abroad. Clubs are also linked to special interests, sports, recreation, and cultural, spiritual, and social activities. In addition, there are nine student programs, which are larger student organizations, that exist to provide resources to a specific constituency of students. Student Programs have office space on campus, paid student leader positions, and a budget allocation each year.

ASOIT (Student Government)

www.oit.edu/asoit

The purpose of ASOIT is to supplement the social, cultural, physical, and educational interests of its members, and to represent the individual and collective interests of the students of Oregon Tech. The membership consists of all admitted students at Oregon Institute of Technology holding a current, valid student ID card.

Campus Activities Board

www.oit.edu/cab

The purpose of the Campus Activities Board (CAB) is to provide a wide array of activities, opportunities, and entertainment for all students, taking into consideration their expressed wishes, interests, and needs. A broad array of events has been offered to students including bands, comedians, student talent shows, lectures, discount bowling and movie nights, and homecoming week.

Outdoor Program (OP)

www.oit.edu/op

The Oregon Tech Outdoor Program (OP) is a student-funded and student-led organization that allows students to enjoy fun activities and the beautiful scenery that surrounds them for an extremely low and reasonable price! Past trips have included: camping, rafting, skiing, mountain biking, and skydiving. In addition to sponsoring trips, the OP also offers low-cost rental equipment for a variety of outdoor activities.

Residence Hall Association (RHA)

www.oit.edu/rha

Each student living on campus is a member of the Residence Hall Association (RHA). This organization works with the Residence Life staff to promote, organize, coordinate and implement programming during the academic year. RHA sponsors everything from "Spring Fling" to movie nights. The RHA is funded in part through incidental fees and belongs to the residents.

Student Veterans Program (SVP)

www.oit.edu/svp

The members of the SVP are dedicated to satisfying the needs of any veteran of the Oregon Tech and KCC community during and after their time as a student, staff, or faculty. With the direction of the elected officers of SVP, the support of KCC Veterans Club, and the assistance of the Campus Veterans Service Officer (CVSO), the SVP shall reach out to the greater Oregon Tech and Klamath community and seek ways of building friendships and partnerships that are based on the same honor, duty, loyalty, and selfless service instilled in all veterans.

Student Media

The EDGE - Student Newspaper

The Edge is student led and student read. Oregon Tech's student newspaper, The Edge, is a weekly publication written by students from all majors and produced by a student staff. It is published during fall, winter, and spring terms, with a satirical edition, The Ledge, published once per term.

KTEC Campus Radio Station
www.oit.edu/ktec
89.5 FM
KTEC hit the milestone of their 65th year of operation in the spring of 2017 and is the oldest FM station in Southern Oregon. KTEC is operated by student staff and volunteers, and is programmed to serve the interests of the Oregon Tech student body and the Klamath Falls community.

Oregon Technical Broadcasting (OTB)
www.oit.edu/otb
OTB is the student-run video production program at Oregon Tech. OTB films campus events, creates a YouTube vlog series, and provides video services to campus organizations upon request.

Career Services

Klamath Falls: LRC, 219
(541) 885-1020
career@oit.edu
Portland-Metro: Room 131
(503) 821-1155
career@oit.edu
www.oit.edu/career

Career Services works in comprehensive ways to support Oregon Tech's students and alumni into developing and achieving their career goals. Services include: individual career advising; workshops and classroom presentations on resume writing, job interviewing, job search, and applying to graduate school; on-campus employer recruitment, career fairs, career resource materials, and a website with information on a wide range of career topics.

Career Services also offers all students and alumni the Handshake website, a centralized job portal where employers connect with students for on-campus jobs, part-time off campus jobs, internships, and career positions.

College Union

Information Desk
(541) 885-1030
www.oit.edu/visitors-info/college-union
The College Union is the center of student activity on campus. Located within the Union are the student government offices, Campus Life, the Treehouse, Student Services staff, Campus Dining operations, *The Edge* student newspaper, the Tech Nest bookstore, the Outdoor Program, the Student Veterans Program and lounge, and the main campus auditorium. In addition, there are comfortable study and lounge areas and meeting rooms for both student and community use. Coffee house functions, lectures, special classes, shows, dances, and movies are among the typical events scheduled in this facility.

For information about using space in the College Union or to make a reservation, contact the CU Information Desk located on the lower level, south of the main entrance.

Disability Services

Klamath Falls: LRC 229C, (541) 851-5227
Portland-Metro: Room 432, (503) 821-1305
access@oit.edu
www.oit.edu/academics/ssc/disability-services
Oregon Institute of Technology is committed to accommodating the academic and programmatic needs of qualified students with disabilities. Students with a documented disability who require assistance or academic accommodations should contact the office of Disability Services at access@oit.edu immediately to discuss eligibility, to ensure timely provision of services. Please contact the Disability Services office at the campus closest to you: Klamath Falls (541) 851-5227 or Portland-Metro (503) 821-1305. Specific information and Disability Services forms can be found at www.oit.edu/academics/ssc/disability-services.

Integrated Student Health Center (ISHC)

Phone (541) 885-1800
Fax (541) 885-1866
health@oit.edu

The Integrated Student Health Center (ISHC), located at the main campus in Klamath Falls, provides general medical care for illnesses and accidents, medical referral, counseling and wellness programs. Students taking six or more on-campus credit pay the Student Health fee each term, which covers most services offered by the clinic (including counseling, medical appointments, and a variety of other services). Students with less than six credit hours can utilize ISHC services by paying the student health fee. Students at the Portland-Metro campus also pay a Student Health fee, which funds a full-time counselor on-site.

Health Requirements to Register
Newly admitted students must complete the following health requirements upon admission (note: International students must complete a similar process prior to coming to campus; work with your Admissions Counselor to provide the required information). Failure to complete these requirements will result in a "health hold" on the student's account, affecting a student's ability to conduct Business Office transactions and to register or make changes to your courses. Once students are admitted, they will be able to access the Student Health Portal, located in TECHweb, under the "Student Resources" tab. After confirming their date of birth, students will need to do the following:

- access the required forms by clicking on "Forms"
- complete the "Health History Form" and "High Risk Tuberculosis Screening Questionnaire" by clicking on the hyperlinks
- acknowledge "Privacy Practices" and "Consent for Treatment" by clicking on their links

- click on the "Immunizations Page in EMF Forms" hyperlink, and provide the dates that you received 2 doses of the Measles or MMR vaccine.
- two doses of measles/mumps/rubella vaccine (MMR) are required for all full-time college students born on or after Jan. 1, 1957.The first dose must be given after the first birthday. The second dose must be after 1989.*

This requirement is supported by: Oregon Administrative Rule 333-050-0130 and the American College Health Association Guidelines: Recommendations for Institutional Pre-matriculation Immunizations, April 2014.

Medical Clinic Services
Oregon Tech's ISHC health care providers are committed to providing high quality, personalized care. The medical clinic is staffed by a physician, advanced practice nurse, registered nurse, and a psychiatric nurse. Diagnosis and treatment of acute and chronic illnesses, birth control and emergency contraception, routine laboratory procedures, immunizations, wart removal, gynecological exams, minor surgery and care of minor injuries are some of the services provided. Major emergencies are referred to Sky Lakes Medical Center adjacent to the Klamath Falls campus. Referrals are made to specialists as needed. Visits are free with low costs for medications, laboratory work, immunizations, and some treatments.

Counseling Services
Counselors are available to discuss personal, academic and career concerns. Crisis services are available and referrals are made to community resources if needed. Sessions are confidential and are provided free of charge to students enrolled for six or more on-campus credits. Testing is also available for Learning Disabilities and Attention Deficit Hyperactivity Disorder for additional fees.

Personal counseling focuses on concerns such as self-esteem, relationship issues, academic performance, family difficulties and troubled sleep. Some specific issues dealt with are: depression; anxiety, substance abuse, suicide, conflicts with parents, spouses or children; loneliness; dating problems; study skills; coping with past or present abusive situations; and grief. A psychiatric nurse practitioner is available for psychotropic medicine management.

Wellness Programs
A Health Educator is on staff to assist students in staying healthy and fit while attending Oregon Tech. Free individual appointments are available for personalized health and fitness programs, BMI testing, nutrition education and smoking cessation. Awareness events and health promotion programs are also provided on a regular basis campus-wide. Please call the ISHC to make an appointment or learn more about various campus-wide wellness activities.

Student Health Advisory Committee (SHAC)
SHAC serves as an advisory committee to the ISHC and a voice to the administration about student health concerns. All students are welcome to apply to join this committee. Call or visit the ISHC to apply.

Fees/Charges
As indicated previously, students taking six or more on-campus credit hours pay a Student Health fee each term. This fee entitles students to services offered by the medical clinic, counseling and wellness programs. Other students can use the center if they pay the health fee. Office visits are free for illness and injury, evaluation, treatment, questions and other reasons. However, additional charges may be necessary for medications, treatments, supplies, immunizations and laboratory tests. Costs for these services and supplies are kept well below the market price for student affordability. No cash is necessary at the time of visit and no insurance is required. All medical expenses rendered outside the ISHC from private physicians, laboratories, or hospitals are the student's financial responsibility.

Multicultural Affairs

College Union, 2nd Floor
(541) 885-1011
www.oit.edu/multicultural-student-services

Multicultural Life is committed to ensuring that Oregon Tech is a community where everyone is valued and respected, and diverse backgrounds and beliefs are honored. It is responsible for the development, coordination, and administration of programs and initiatives, which promote an inclusive multicultural student community. The office supports multicultural clubs and programs on campus and provides advising to students from underrepresented communities.

Project Unity
Project Unity's mission is to mentor and empower underrepresented students of Oregon Tech, guide and strengthen identities, and build a vibrant multicultural community among first-year students. We aim to help students explore their own identities (e.g. sexuality, gender, race, ethnicity, class, etc.) while also helping them acclimate to campus.

Treehouse
www.oit.edu/treehouse
Our vision is centered on a deeper understanding and appreciation for diversity, inclusivity, and equality for the people of Oregon Tech, Klamath Falls, and the world at large. Our mission is to provide programs, education, events, physical space, support and advocacy to the peoples of Oregon Tech, to work actively against oppression, hate, sexism, racism, inequality and other injustices, and promote a safe and welcoming environment for women, people of color, the LGBTQIA+ community and other diverse groups.

The Treehouse is a student-led organization under Multicultural Life that focuses on spreading awareness and inclusivity mostly through the organization of student events. The Treehouse is responsible for helping plan, advertise, organize and lead student events focused on increasing a deeper understanding and appreciation for diversity, bringing people together, while making something happen on campus and in people's lives.

Student Affairs

College Union, 2nd Floor
(541) 885-1011
www.oit.edu/student-affairs

The Student Affairs Office is the office location for the Vice President for Student Affairs and the Dean of Students, and the Executive Assistant. The division of Student Affairs provides direct service to students in the following offices: Athletics, Campus Life, Campus Safety, Career Services, College Union, Housing & Residence Life, the Integrated Student Health Center, and the Student Success Center, which is composed of Disability Services, Testing and Peer Consulting Services, and TOP (a Trio program).

The Vice President for Student Affairs and her staff maintain close relationships with all Oregon Tech students, including the Klamath Falls campus, Portland-Metro campus, Online, Salem, Seattle and student organizations. Student Affairs staff are available for consultation and collaboration on all matters pertaining to student well-being and success.

Student Success Center (SSC)

Learning Resources Center, Room 228
(541) 851-5179
ssc@oit.edu
www.oit.edu/ssc

The Student Success Center (SSC) is a multi-purpose department designed to enrich learning, teaching, and student success at Oregon Tech. The SSC consists of Peer Consulting (Tutoring), TOP, Disability Services, and Testing. The SSC helps students succeed by providing effective academic assistance, support, and resources through promotion of student learning, personal growth, and programs designed to enhance achievement, retention, persistence, graduation, and post-graduate success. The SSC provides peer tutoring for matriculated Oregon Tech students, academic success (ACAD) classes, accommodations for students with disabilities, test proctoring, as well as many other services to support students, staff, and faculty in an effort to facilitate student success at Oregon Tech. The SSC also functions as the University Testing Center by offering testing, distance testing, placement testing, test proctoring, and other standardized testing programs.

The SSC is an integral part of Oregon Tech's student success initiatives and strives to provide effective programs and services to create a welcoming, supportive, and successful campus.

Tech Opportunities Program - TRIO

Learning Resource Center, Room 228
(541) 885-1125
TOP@oit.edu
www.oit.edu/academics/ssc/tech-opportunities-program

The Tech Opportunities Program (TOP) is a federally funded TRIO program designed to assist first-generation students, low-income students, and student with disabilities in completing their degrees at Oregon Tech. TOP staff work closely with students to comprehensively assess academic and financial needs and to develop personalized plans for college success.

Participants may be eligible for a variety of academic support services, including group and/or individual tutoring, peer mentoring, networking with other students, college-success workshops and classes, supplemental academic advising, and limited financial assistance. Learn more about TOP at www.oit.edu/academics/ssc/tech-opportunities-program.

Testing Services

Klamath Falls: LRC 230, (541) 885-1791
testing@oit.edu
Portland-Metro: Room 429, (503) 821-1263
Jenni.Betschart@oit.edu
www.oit.edu/academics/ssc/testing-services
Testing Services provides a quiet and secure testing center for all of your testing needs. The testing center is certified by the NCTA and is a CCTC participant. It provides trained professional proctors and can provide assistance of a reader or scribe if required by the test-taker.

Peer Consulting Services

Klamath Falls: LRC 233, (541) 851-5226
peerconsulting@oit.edu
Portland-Metro: Room 429, (503) 821-1263
w.peerconsulting@oit.edu
www.oit.edu/academics/ssc/peer-consulting-services
Peer Consulting is a completely free academic support service available to all students of Oregon Tech. Our goal is to provide assistance in all areas, majors, and courses offered at Oregon Tech. Peer Consultants are Oregon Tech students who have taken the same classes you have and have earned a B or better in their areas of expertise. Peer Consultants can help clarify ideas, concepts, theories, and skills your professors are teaching in class. Students can schedule an appointment or drop-in during open hours. To view the schedule and hours, please visit our website.

Supplemental Instruction (SI) is a new academic support service offered through the Peer Consulting Center. SI identifies historically difficult courses and provides peer assisted study sessions to enhance student success. The students who facilitate SI study sessions are called SI Leaders and are trained in collaborative learning techniques. Students who regularly attend SI study sessions will improve their critical thinking skills, establish positive studying techniques, and are more likely to pass their courses successfully. For a list of courses supported by SI, please visit our website.

University Development

Hoss Business Center
(541) 885-1130

The University Development Department is charged with providing financial support of Oregon Tech's mission by connecting donors, alumni, and friends with philanthropic opportunities at the university in partnership with the Oregon Tech Foundation. University Development works to build positive relationships with students, faculty, staff, alumni and friends of the university to enhance and create opportunities that foster a tradition of philanthropic support. University Development engages in initiatives and activities that embody institutional values and position Oregon Institute of Technology among the nation's leading technological and health professions universities. Fundraising, alumni relations, community outreach and other activities serve to promote the distinctive role and numerous educational, research and public service contributions of Oregon Tech throughout our communities, the nation, and internationally.

The Oregon Tech Alumni Association

(503) 821-1145
alumni@oit.edu
alumni.oit.edu

The Alumni Relations office promotes interactions and loyalty of alumni and currently enrolled students toward Oregon Institute of Technology. Services and activities include regional social events, student activities, reunions and continuing education programs. Alumni have the opportunity to keep in touch with other alumni through the university's alumni Web page and other means of communications regarding their academic major and Oregon Tech.

The Oregon Tech Alumni Association, established in 1949, is guided by the Alumni Advisory Board and exists to support and promote Oregon Tech as a premier learning institution and to provide a structure for alumni affiliation. Membership is free and automatic to anyone who has completed at least 90 credits at Oregon Tech. Areas of special interest for the Alumni Association include assisting the university with new student recruitment activities, career networking, social and educational activities and the financial support of Oregon Tech. The Alumni Association is an affiliated organization of the Oregon Tech Foundation.

The Oregon Tech Foundation

(541) 885-1130

The Oregon Tech Foundation was established to support the educational, cultural, charitable, and service activities of Oregon Institute of Technology through philanthropic support. Established as a 501(c)(3) tax-exempt organization, the Foundation is a separate legal entity from the University and is the designated charitable arm of the University.

The Foundation is governed by a Board of Directors that represents a broad range of community leaders, alumni and private benefactors. The Foundation board of directors is tasked with management and growth of the assets of the Foundation and for participating in fundraising efforts of Oregon Tech.

The Foundation has enriched the University and student life by combining their efforts with the Oregon Tech administration and community leaders to accomplish some of the most notable projects on campus:

- Martha Anne Dow Center for Health Professions
- Jesse A. Crabtree Civil Engineering Learning Plaza
- Danny Miles Court floor and scoreboard replacement
- Shaw Historical Library
- John F. Moehl football stadium

Enabling Oregon Tech to build a great university and maintain an unparalleled level of excellence for students, the Foundation annually provides approximately $1 million to Oregon Tech. The Foundation provides student support through numerous scholarships, innovation through student projects, hands-on experiences with equipment in modern classrooms, labs, and buildings, and providing a professional network through alumni relations.
The Foundation works closely with its affiliated organizations, including the Oregon Tech Alumni Association and the Shaw Historical Library.

Directories

Governance of Oregon Institute of Technology

Prior to 2015, the Oregon Institute of Technology was governed by the Oregon State Board of Higher Education, the governing board for the seven public universities in Oregon. In April 2014, the State Board of Higher Education authorized the Oregon Institute of Technology to establish a Board of Trustees, appointed by the Governor and approved by the Senate.

Effective July 1, 2015, the University became an "independent public body" governed by the Board of Trustees with every authority necessary or appropriate for the operation of a major public university. The Oregon Tech Board of Trustees approves the University's mission, programs, budgets, and strategies; and works with the Higher Education Coordinating Commission (HECC) to provide final approval for the University's mission and any new academic programs.

Oregon Tech Board of Trustees

Members and term expiration dates:
Dr. Jeremy Brown, 2022
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Dr. Lisa Graham, 2022
Kathleen Hill, 2022
Vincent Jones, Vice Chair, 2022
Dana Londen, 2021
Rose McClure, 2020
Jill Mason, 2023
Kelley Minty Morris, 2022
Grace Rusth, 2021
Mike Starr, 2022
Paul Stewart, 2022
Fred Ziari, 2022
Vacant position #9
Oregon Tech President, ex-officio

Administrative Offices

President, Nagi G. Naganathan, Ph.D., ASME Fellow

Provost and Vice President for Academic Affairs, Joanna Mott, Ph.D

Vice President for Finance and Administration, Vacant

Vice President for Strategic Enrollment Management, Dean of Online Learning, Vacant

Vice President for Student Affairs and Dean of Students, Erin Foley, Ph.D.

Vice Provost, Abdy Afjeh, Ph.D.

Associate Vice Provost for Academic Excellence, Vacant

Associate Vice President and Chief Information Officer, Connie Atchley

Associate Vice President for Communication and Public Affairs, Di Saunders

Associate Vice President for Human Resources and Affirmative Action, Maureen De Armond, JD, SHRM-SCP

Associate Vice President for University Development, Vacant

Assistant Vice President for Financial Operations, Stephanie Pope

Assistant Vice President for Government Relations, Vacant

Dean, College of Engineering, Technology and Management, Tom Keyser, Ph.D.

Dean, College of Health, Arts and Sciences, Vacant

Associate Dean, College of Engineering, Technology and Management, Brian Moravec

Associate Dean, College of Health, Arts and Sciences, Vacant

Admissions, Erik Johnson, Director

Advising & Retention, Vacant

Athletics, John Van Dyke, Director

Campus Life, Holly Anderson and Josie Hudspeth, Associate Directors

Campus Safety, Ed Daniels, Director

College Union, Shellie Wilson, Manager

Educational Partnerships and Outreach, Carlene Starr, Director

Facilities Management and Planning Services, Thom Darrah, Director

Financial Aid, Tracey Lehman, Director

Housing and Residence Life, Mandi Clark, Director

Institutional Research, Farooq Sultan, Director

Integrated Student Health Center, Gaylyn Maurer, Administrative Director

Library Services, John Schoppert, Director

Multicultural Affairs, Fianluigi Benvenutto, Director

Online Learning, Carrie Dickson, Director

OMIC Research and Development, Craig Campbell, Executive Director

Oregon Renewable Energy Center, Mason Terry, Director

Procurement, Contracts and Risk Management, Vivian Chen, Director of Procurement, Contracts & Risk Management

Registrar's Office, Wendy Ivie, University Registrar

Senior Advisor to the President and Board Secretary, Oregon Tech Board of Trustees, Sandra Fox

Sponsored Projects & Grants Administration, Barbara Neal, Director

Student Success Center, Tanya Coty, Director

University General Counsel, David Groff

Oregon Tech Foundation Board of Directors

Diedra Thompson, President
Alan Polaski, Vice President
Don Young, Treasurer
Jim Blair, Secretary
Lance Bishop
Don Boyd
Ann Cavanaugh
Sarah Dammen
John Davis
James De Hoog
Bill DeWitt
Gerald Freschi
Steven Hyde
Don Johnson
Sally Jones
Trevor Mauch
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Darrel Samuels
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Richard Siemens
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Tom Van Thiel
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Ex-Officio

Tracy Ricketts, Interim Executive Director
Nagi Naganathan, Oregon Tech President
Brian Fox, Oregon Tech Vice President for Finance and Administration
Ken Vandehey, Oregon Tech Alumni Advisory Board President
Jeremy Morris, President, Shaw Historical Library

Administration

Abdy Afjeh (2018), Vice Provost. B.S., Sharif University of Technology (1997); M.S., University of Toledo (1981) ; Ph.D., University of Toledo (1984).

Holly Anderson (2012) Associate Director Campus Life – Student Engagement. B.S. (2008), Warner Pacific College.

Diana Angeli (2006), Executive Assistant, President's Office.

Connie Atchley (2019) Associate Vice President/Chief Information Officer. B.S. (1998) Oregon State University; M.S. (2010) University of Oregon.

Gianluigi Benenutto (2019), Director, Multicultural Affairs, Campus Life

Jennifer Bavarskas (2005), Health Educator, Integrated Student Health Center. B.A. (1991), University of Oregon; M.S. (2000), San Jose State University.

Jennifer Berdyugin (2019), OREC Lab Manager.

Jennifer Betschart (2015), Assistant Director of Student Services, Portland-Metro. B.S. (1999), University of Puget Sound; M.Ed. (2012), Oregon Status University.

Karen Blevins (2013), Associate Director Payroll Services, Business Affairs.

Ashley Bordelon (2019), Behavior Analyst, Humanities & Social Sciences.

Rebecca Burkeen (2017), Alumni Relations Manager, Development.

Kelly Caleb (2007), Athletic Trainer, Athletics. A.S. (1996), Oregon Institute of Technology; B.S. (1999), Oregon State University.

Brenda Campbell (2019), Executive Assistant, Office of the Provost.

Craig Campbell (2018), Director of OMIC Research and Development.

Katie Cavendish (2015), Program Manager, Development.

Alicia Chapman (2019), Research Grant & Project Lead, OMIC.

Vivian Chen (2015), Director, Procurement, Contracts & Risk Management. B.A. (2006) Wellesley College; J.D. (2011) University of California, Berkeley.

Cindy Childers (2006), Accounting Manager, Business Affairs. B.S. (2004), Oregon Institute of Technology.

Anna Clark (2018), Financial Analyst, Budget Office.

Mandi Clark (2004), Director, Housing and Residence Life. B.A. (1997), Kansas State University; M.S. (1999), University of Nebraska.

Tammy Clark (2007), Executive Assistant, Dean College Health, Arts and Sciences.

Jason "Jake" Coatney (2007), Senior Counselor, Financial Aid. A.A. (2002), College of the Siskiyous; B.S. (2005), Eastern Oregon University.

Chris Cook (2014), Grounds Supervisor, Facilities Management Services.

Jeffrey Corkill (2013), Head Golf Coach, Athletics. B.S. (1976), California Polytechnic University.

Tanya Coty (2018), Director, Student Success Center. B.S. (1991), University of Minnesota; M.S. (2017), University of Alaska.

Jolyn Dahlvig (2019), Associate Dean of Students, Portland-Metro

Edward Daniels (1988), Director, Campus Safety.

Julie Daniels (2007), Scholarship Officer/Counselor, Financial Aid. B.A. (2003), Southern Oregon University.

Krista Darrah (2017), Operations Manager, Development.

Thom Darrah (2016), Director, Facilities Management Services.

Lindsey Davis (2013), Academic Specialist, Retention. B.A. (2008), University of Idaho; M.A. (2010) Washington State University.

Maureen De Armond (2019), Associate Vice President, Human Resources

Ryan Deady (2016), Transfer Recruiter, Admissions. B.A. (2014) University of Montana.

Carrie Dickson (2014), Director, Online Learning, B.S. (2009), Oregon Institute of Technology; M.B.A. (2013), Southern Oregon University.

William Dowling (2016), Counselor, Integrated Student Health Center.

Nyesia Driver (2015), Coordinator of Testing Services, Student Success Center. B.S. (2013) University of Arkansas; M.S. (2015) Arkansas Tech University.

Melissa Dubois (2014), Director, South Metro-Salem STEM Hub, B.S. (1999), Northeastern University, Ph.D. (2005), University of Wisconsin.

Kaiulani Evans-Bautista (2016), Associate Director, Recruitment & Yield, Admissions.

Erin Foley (1999), Vice President of Student Affairs; Dean of Students. B.S. (1988), University of Arizona; M.A. (1991), Michigan State University; Ph.D. (1996), Indiana University.

Sandra Fox (2014) Senior Advisor Board Secretary B.S. (1994), Cal Poly, San Luis Obispo; MBA (1996), Cal Poly, San Luis Obispo.

Lori Garrard (2018). Executive Assistant, Development.

Michael Garrard (2007), Sports Information/Marketing Director, Athletics.

Jamie Goodpaster (2016), Disability Services Coordinator, Portland-Metro.

Corrine Graves (2018), Transfer Outreach Coordinator, Educational Partnerships and Outreach.

David Groff (2018), University General Counsel, General Counsel.

Pamela Grove (2018), Assistant to University General Counsel.

Sandi Hanan (2008), Assistant Director, Human Resources. A.S. (1999), Oregon Institute of Technology; B.S. (2013), Oregon Institute of Technology.

Lori Harris (2009), Assistant Director, Business Affairs. A.S. (1983), Oregon Institute of Technology.

Brandon Held (2018), Academic Specialist, Retention.

Sarah Henderson (2017), Human Resources Consultant, Benefits. B.A. (2000), San Francisco State University; M.S. (2005), Golden Gate University.

Leticia Hill (2006), Procurement and Risk Officer. B.S. (2016), Oregon Institute of Technology.

Shaundrea Hirengen (2015), Coordinator of Peer Consulting, Student Success Center. B.A. (2014), George Fox University.

Jeff Hower (2005), Director, IT and Infrastructure Operations.

Trish Hower (2009), Executive Assistant, Vice President for Research/Associate Provost. B.A. (2004) Oregon State University.

Josie Hudspeth (2014), Associate Director Campus Life - Multicultural Inclusion. B.A. (2011), California State University, Fullerton; M.A. (2013), California State University, Fullerton.

Brandy Hunter (2007), Assistant Director, Student Health.

Wendy Ivie (1999), University Registrar, Registrar's Office. B.S. (1997), Oregon State University; M.S. (2005), Southern Oregon University.

Cathey Jinich (2019), Counselor, Integrated Student Health Center.

Erik Johnson (2018), Director, Admissions. B.S. (2007), Northern Arizona University; M. Ed. (2011), Northern Arizona University.

Joshua Jones (2016), Pre-College Coordinator, Academic Agreements.

Zachary Jones (2018), Academic Specialist, Student Success Center.

Jack Kegg (2011), Head Track & Field and Cross Country Coach, Athletics. B.S. (1996) Western Oregon University.

Thomas Keyser (2018), Dean, College of Engineering, Technology, and Management.

Joshua Koch (2018), CNC Programmer, OMIC.

Fredrick Kowalski (2018), Director, IT Security and Compliance.

James Lake (1988), Maintenance Supervisor, Facilities Services. A.S. (1984), Sierra College.

Tracey Lehman (1999), Director, Financial Aid. A.S. (1986), Mohawk Valley Community College; B.A. (1988), State University of New York; M.S. (2005), Southern Oregon University.

Tabitha Maldonado (2014), Counselor, Financial Aid. B.A. (2008), Concordia University (Oregon).

Anne Malinowski (1990), Assistant Registrar & Veterans Certifying Official, Portland-Metro Operations.

Kendal Marks (2012), Assistant Director of Admissions. B.S., (2007) Southern Oregon University; M.S. Ed., (2013) Arizona State University.

James Marquit (2017), Admissions Counselor, Admissions.

Sarah Matchett (2016), Residence Life Coordinator, Housing and Residence Life.

Gaylyn Maurer (2013), Administrative Director, Integrated Student Health Center. B.S. (1993), University of Houston; M.A. (1996), University of Denver.

Kelsey McCauley (2020), Government Relations Coordinator.

Michael McCormick (2020), Title IX & Employee Relations Investigator.

Joel McPherson (2011), Director of Marketing. B.S., University of Oregon.

Barb Meng (2015), Executive Assistant, Academic Excellence.

Scott Meredith (2009), Head Women's Basketball Coach, Athletics. B.A. (1987) Humboldt State University, M.A. (2000) St. Mary's College.

Michelle Meyer (2014), Accounting Services Manager, Business Affairs. B.S. (2004), Oregon State University; Certified Public Accountant, Oregon.

Matthew Miles (2007), Head Baseball Coach, Athletics. A.A. (1992), Oregon Institute of Technology.

Sarah Moore (2016), Assistant Director, Career Services.

Brian Moravec (1989), Associate Dean, College of ETM. B.S.M.E. (1980); M.S.A.A. (1987), University of Washington.

Kenneth Murczek (2020), Head Women's Volleyball Coach, Athletics.

Corey Murphy (2014), Coordinator, Retention. B.S. (2011), Oregon State University.

Iona Musgnung (2018), Associate Director, Campus Life, Portland-Metro.

Nagi Naganathan (2017), President. B.E. (1978), National Institute of Technology; M.S. (1981), Clarkson University; Ph.D. (1986), Oklahoma State University.

Urmaze Naterwalla (2019), Research Operations Officer, OMIC.

Barbara Neal (2016), Director of Grants & Sponsored Research.

Erica Nelson (2018), Assistant Athletic Trainer. M.S. (2018), Pacific University.

Valjean Newsome (1997), Executive Assistant to Dean of Engineering, Technology, and Management.

Abby Neirynck (2020), Admissions Counselor, Admissions.

Deanne Pandozzi (2002), Coordinator of Academic Enrichment, Retention. B.S. (2010), Oregon Institute of Technology.

Justin Parnell (2012), Head Men's Basketball Coach, Athletics. B.S. (2011), Oregon Institute of Technology.

Adria Paschal (2007), Senior Executive Assistant to the President. A.A. (2016), Oregon Institute of Technology.

Ashlie Pence (2016), Assistant Registrar, Registrar's Office. B.S. (2016), Oregon Institute of Technology.

Suzet Petersen (2002), Assistant Director, Financial Aid. A.A. (1996), B.S. (1998), Oregon Institute of Technology.

John Phillips (2020), Admissions Counselor, Admissions.

Stephanie Pope (2017), Assistant Vice President, Financial Operations.

Brandon Porter (2015), Head Men's Soccer Coach, Athletics.

Lara Pracht (2016), Director Academic Affairs, Portland-Metro.

Leanne Reed (2014), Counselor, Portland-Metro. B.A. (1994), Centenary College; M.A. (2005), Southern Methodist University.

Anthony "Tony" Richey (2003), Chief Technology Officer. A.A. (1989), B.S. (2005), Oregon Institute of Technology.

Dacarie Robertson (2018), Disability Services Specialist. B.S., Southern Oregon University; M.S., University of Denver.

Madeline Roche (2018), Counselor, Admissions.

Grace Rusth (2011), Assistant Director, Educational Partnerships and Outreach. B.S. (2009), Oregon Institute of Technology; M.A. (2014), Chicago School of Professional Psychology.

Di Saunders (2014), Associate Vice President, Communication and Public Affairs.

John Schoppert (2019), University Librarian, Library.

Briana Schwenk (2018), Academic Specialist, Student Success Center.

John Scott (2019), Counselor, Integrated Student Health Center.

Carleen Starr (2013), Director, Educational Partnerships & Outreach. B.S. (2005), Oregon State University; M.A.I.S. (2007), Oregon State University.

Greg Stewart (2004), Head Women's Softball Coach, Athletics. B.S. (1992), Sterling College.

Nellie Stewart (2007), Executive Assistant, Finance and Administration. B.S. (2011), Oregon Institute of Technology.

Harmony Stobaugh (2018), Human Resources Consultant. B.S. (2016), Campbellsville University.

Cynthia Stripling (2013), Office Coordinator, Admissions.

Karissa Sultan (2010), Accounts Receivable Manager, Business Affairs.

Casey Tate (2020), Head Women's Soccer Coach, Athletics.

Carl Thomas (2011), Regional Recruiter, Admissions. B.S. (1994); MiM (2002), Southern Oregon University.

Valarie Thrower (2019), Admissions Counselor, Admissions.

Paul Titus (2018), Executive Assistant, Office of the Provost. B.S. (2013), Oregon Institute of Technology.

John VanDyke (2018), Director, Athletics.

Michelle Vitali (2017), Executive Assistant, OMIC.

Christine Ward (2018), Instructional Designer, Online Learning. B.A. (2003), George Fox University; M.Ed. (2009), Boise State University.

Wakaya Wells (2017), Assistant Director, Multicultural Affairs, Campus Life. B.A. (2015), Dartmouth College.

Joshua Wetzler (2016), Marketing and Promotions Coordinator, Athletics. B.S. (2009); Oregon Institute of Technology.

Dierdre Williams (2009), Executive Assistant, Strategic Enrollment Management.

Erin Williams (2013), Athletic Programs Operations, Athletics.

Shellie Wilson (2004), Manager, College Union. A.S. (2001), B.S. (2004), Oregon Institute of Technology; M.B.A. (2009), Southern Oregon University.

Rachel Winters (2014), Executive Secretary, Student Affairs.

Mira Wonderwheel (2018), Annual Giving Manager, Development. B.A. (1999), Sonoma State University.

Desiré Wooten (2019), Human Resource Consultant, Human Resources. B.S. (2019) Colorado State University.

Instructional Faculty

This listing reflects faculty for the 2020-2021 academic year. In some cases, changes taking effect for 2020-21 are included in the faculty lists under the department descriptions.

Mateo Aboy (2005), Professor, Electrical Engineering and Renewable Energy. B.S. (2002), B.S.E.E. (2002), M.S.E.C.E. (2004), Portland State University; Dipl. Ing. (2003), M.Phil. (2004), Ph.D. (2005), ETSIT-University of Vigo; Exec. Cert. (2007), Massachusetts Institute of Technology; M.B.A. (2011), L.L.B/QLD (2014), University of London. Registered Professional Engineer (PE), European Union (COIT No. 12684). Registered US Patent Agent (USPTO Bar Admission No. 64040). Certified Licensing Professional (CLP).

Abdelouahab Abrous (2014), Associate Professor, Manufacturing and Mechanical Engineering and Technology. B.S. (1981), University of Science & Technology, Algeria; M.S. (1984), University of Washington, Seattle; Ph.D. (1988), University of Washington, Seattle. Registered Professional Engineer, Washington, Idaho, Oregon, and California.

Kathleen Adams (2015), Associate Professor, Humanities and Social Sciences, Director, MS Marriage and Family Therapy. B.S. (1978), University of Wisconsin, Milwaukee; M.S. (1980), University of Wisconsin, Madison; Ph.D. (2001), Iowa State University.

Steve Addison (2016), Associate Professor, Manufacturing and Mechanical Engineering and Technology. B.A. (1984), Ph.D. (1991), University of Cambridge.

Seth Anthony (2011), Associate Professor, Natural Sciences. B.A. (2004), North Carolina State University; M.S. (2011), Ph.D. (2014), Colorado State University.

Dawn Bailey (2017), Associate Professor, Humanities and Social Sciences, Clinical Director/Practicum Coordinator MS Applied Behavior Analysis Program. B.S. (1996), M.S. (2005), Ph.D. (2008), Florida State University.

Richard L. Bailey (1991), Professor, Management. B.S. (1984), M.A. (1985), Utah State University. Certified Public Accountant.

Sandra Bailey (2000), Professor, Management. B.S. (1985), Utah State University; M.Ed. (2005), Oregon State University.

Rachelle Barrett (2018), Instructor, Medical Laboratory Science. Certificate (2013), University of Texas Medical Branch; B.S. (2005), Oregon State University; B.S. (2006), Oregon Institute of Technology.

Krista Beaty (2017), Instructor, Dental Hygiene. A.A.S. (2004), Clark College; B.S. (2008), Eastern Washington University; M.S.(c), Idaho State University.

Sharon Beaudry (2014), Associate Professor, Management. B.S. (1985), College of New Rochelle; J.D. (2009), Northwestern California University; M.B.A. (2013), Northcentral University. Senior Professional in Human Resources (SPHR).

Vanessa Bennett (2008), Assistant Professor, Medical Imaging Technology. B.S. (2001), Oregon Institute of Technology; M.Ed. (2015), Western Governors University. Certified Nuclear Medicine Technologist (CNMT).

Andrew Bernhard (2019), Clinical Dentist, Dental Hygiene.

Jeannie Bopp (2016), Instructor, Dental Hygiene. B.S. Dental Hygiene (2011), Oregon Institute of Technology.

John Borgen (2016), Assistant Professor, Humanities and Social Sciences.

Charisse Botsch (2015), Instructor, Dental Hygiene (Salem). B.S. (1985), Oregon Health Sciences University.

Monica Breedlove (2013), Assistant Professor, Medical Imaging Technology. B.S. (1996), Oregon Institute of Technology; M.Ed. (2015), Western Governors University. Registered Technologist (R, M, CT, MR, ARRT).

Todd W. Breedlove (1999), Professor, Computer Systems Engineering Technology. B.S. (1996), Oregon Institute of Technology; M.S. (1999), Southern Oregon University.

Kevin J. Brown (2001), Professor, Communication. A.A. (1986), Ricks College; B.A. (1988), Idaho State University; M.A. (1991), Washington State University; Ph.D. (2000), University of Utah.

Ryan Brown (2016), Assistant Professor, Medical Laboratory Science.

Ben S. Bunting, Jr. (2013), Associate Professor, Humanities and Social Sciences. B.A. (2003), Kent State University; M.A. (2007); Ph.D. (2012), Washington State University.

Calvin K. Caldwell (1986), Professor, Computer Systems Engineering Technology. B.S. (1981), Oregon Institute of Technology; M.S. (1989), California State University, Chico.

Barry Canaday (2009), Associate Professor, Medical Imaging Technology. B.S. (1968), Oregon State University; M.S. (1973), Western Washington University; A.A.S. (1978), Peninsula College; A.A.S. (1992), Spokane Community College. Registered Nurse (1978); Registered Cardiac Sonographer (A) – (1992) CCI; Registered Diagnostic Cardiac Sonographer (AE) – (1992) ARDMS. Fellow of the American Society of Echocardiography (FASE) (2012).

Dan Carrere (2017), Assistant Professor, Information Technology. B.S (1998), M.MIS (2000), Georgia College and State University.

Richard D. Carson (2006), Assistant Professor, Medical Imaging Technology. B.S. (1997), Oregon Institute of Technology; M.Ed. (2012), Western Governors University. Registered Technologist (R) (CT) ARRT.

Christopher L. Caster (1999), Associate Professor, Medical Imaging Technology. A.A. (1975), Oregon Institute of Technology; B.S. (1979), Eugene Bible College; B.S. (1996), Oregon Institute of Technology; M.Ed. (2002), University of Phoenix.

Kyle Chapman (2016), Assistant Professor, Humanities and Social Sciences.

Adelaide Clark (2016), Assistant Professor, Natural Sciences. B.S. (2011) Emory & Henry College; Ph.D. (2016), Baylor University.

Gary Clark (2019), Instructor, Computer Systems Engineering Technology.

Mark H. Clark (1996), Professor, Humanities and Social Sciences. B.S. (1984), Rice University; M.A. (1987), University of Houston; Ph.D. (1992), University of Delaware.

Robyn L. Cole (2004), Associate Professor, Medical Imaging Technology. B.S. (2000), Oregon Institute of Technology; M.Ed. (2007), Western Governors University.

Tracey Coon (2018), Assistant Professor, Management. M.S. (2016), Southern New Hampshire University.

Hope J. Corsair (2011), Associate Professor, Electrical Engineering and Renewable Energy. B.S. (1996), Lehigh University, M.S. (2005), University of Colorado-Boulder, M.S. (2010), Ph.D. (2014), The Johns Hopkins University.

Erin Cox (2017), Assistant Professor, Civil Engineering. B.S. (1998), North Dakota

State University, Fargo; M.S. (2000), University of Minnesota, Minneapolis.

Cristina Crespo Veiga (2009), Professor, Electrical Engineering and Renewable Energy. B.S. (2002), M.S. (2004), Portland State University; M.Phil. (2009), Ph.D. (2010), Etsit-University of Vigo. Registered US patent agent (USPTO bar admission no. 68725).

David Culler (2007), Professor, Manufacturing and Mechanical Engineering and Technology. A.A. (1985), University of New Mexico, Albuquerque; B.S. (1988), M.S. (1990), Ph.D. (1994), New Mexico State University, Las Cruces.

Carmen Curtz (2016), Instructor, Emergency Medical Services. A.A.S (2013); B.S. (2012), Oregon Institute of Technology/Oregon Health and Science University.

Kate P. Darling (2003), Instructor, Emergency Medical Services. A.A.S. (1997), Oregon Health and Science University; B.A. (1976), College of the Atlantic.

Don DaSaro (2008), Assistant Professor, Management. A.S. (1964), Metropolitan College; B.S. (1967), University of Missouri Science and Technology; M.B.A. (1991), Marymount University.

Kenneth Davis (2016), Assistant Professor, Mathematics. B.A. (1981), Reed College; M.S. (1985), Portland State University; Ph.D. (1989), Washington State University.

Dibyajyoti Deb (2013), Associate Professor, Mathematics. B.S. (2004), Chennai Mathematical Institute, India; M.S. (2006), University of Kentucky; Ph.D. (2010), University of Kentucky.

Irina Demeshko-Prosnik (2006), Associate Professor, Manufacturing and Mechanical Engineering and Technology. B.S. (1996), B.A. (2001), M.S. (1996), M.A. (2001), Far Eastern State Transport University.

Jeff Dickson (2010), Associate Professor, Management. B.S. (2006), Oregon Institute of Technology; M.B.A. (2012), Southern Oregon University.

Oleksandr Dobzhanskyi (2018), Assistant Professor, Electrical Engineering and Renewable Energy Engineering.

Caroline Doty (2016), Assistant Professor, Medical Laboratory Science. B.S. (2007), Clayton State University; M.S. (2012), Northwestern University; B.S. (2014), Oregon Institute of Technology and Oregon Health Sciences University. M.t. (ASCP) certified.

Allan A. Douglas (2014), Associate Professor, Electrical Engineering and Renewable Energy. B.S. (1991), M.S. (1993), Oregon State University.

George Drouant (2018), Instructor, Computer Systems Engineering Technology. B.S.

James Eastham (2014), Assistant Professor, Electrical Engineering and Renewable Energy. B.S. (2009), Oregon Institute of Technology; M.S. (2014), Portland State University.

Steve Edgeman (2012), Assistant Professor, Manufacturing and Mechanical Engineering and Technology. B.S. (2003), M.S. (2012), Oregon Institute of Technology.

Todd Ellingson (2008), Assistant Professor, Medical Director, Emergency Medical Services. B.S. (1998), Washington and Lee University; M.D. (2003), Oregon Health and Science University.

Tricia Elliot (2018), Instructor, Natural Sciences. B.S. (1998), California State Polytechnic University; M.S. (2002), California State Polytechnic University.

Jared Emard (2016), Professor of Practice, Management. B.S. (2009), B.S. (2010), Oregon Institute of Technology; M.B.A. (2016), Southern Oregon University.

Kerry Farris (2017), Instructor, Natural Sciences.

James P. Fischer (1999), Professor, Mathematics. B.S. (1989), B.A. (1991), Humboldt State University; M.S. (1993), University of New Hampshire; Ph.D. (1998), Oregon State University.

Carey Fitzgerald (2019), Assistant Professor, Humanities and Social Sciences. B.S. (2006), Central Michigan University; M.S. (2008), Central Michigan University; Ph.D. (2011), Central Michigan University.

Sarah Fitzpatrick (2013), Associate Professor, Respiratory Care and Sleep Health. B.S. (2010), Oregon Institute of Technology; M.H.A. (2012), Pacific University.

Tiernan Fogarty (2002), Professor, Mathematics. B.S. (1995), M.S. (1997), Ph.D. (2001), University of Washington.

Matthew Frye (2017), Assistant Professor, Communication. B.A. (2008), DePauw University; M.A. (2010), Washington State University; Ph.D. (2017), Washington State University.

Andria "Andie" Fultz (2012), Associate Professor, Communication. B.S. (1997), M.S. Communication Studies (2007), M.S. Post-Secondary, Adult, & Continuing Education (2007), Portland State University.

Kamal Gandhi (2017), Assistant Professor, Natural Sciences. B.S. (2001), UC San Diego; Ph.D. (2006), UC Berkeley.

Yanqing Gao (2013), Associate Professor, Manufacturing and Mechanical Engineering and Technology. B.S. (1982), Qingdao University of Science & Technology; M.S. (2000), Southern Illinois University, Edwardsville; M.S (2001), Ph.D. (2010), University of Arizona.

Kevin Garrett (2017), Assistant Professor and Clinical Director, M.S. Marriage and Family Therapy Program, Humanities and Social Sciences. B.S. (2003), Utah State University; M.Ed. (2006), University of Oregon; MedFT Certificate (2009), University of Nebraska Medical Center/University of Nebraska-Lincoln; Ph.D. (2014), Kansas State University.

Michael C. Gilinsky (2016), Instructor, Director of Clinical Education, Respiratory Care. B.S. (2012), Oregon Institute of Technology; Registered Respiratory Therapist (RRT), RRT-Neonatal Pediatric Specialty, RRT-Adult Critical Care Specialty.

Iris K. Godwin (2007), Associate Professor, Head of Special Collection and University Archives, Library Services. B.A. (2000), Rhodes College; M.L.I.S. (2005), University of Tennessee, Knoxville.

Pramod Govindan (2019), Instructor, Computer Systems Engineering Technology. B.S. (1997), Govt. Engineering College; M.S. (2009), Illinois Institute of Technology; Ph.D. (2015), Illinois Institute of Technology.

Ashton Greer (2019), Assistant Professor, Civil Engineering. B.S. (2014), University of Alabama; M.S. (2015), University of Alabama; Ph.D. (2019), University of Alabama.

Chelsea Gustafson (2016), Assistant Professor, Natural Sciences. B.S. (2006) Southern Oregon University; Ph.D. (2016) University of California, Santa Cruz.

Tara Guthrie (2011) Assistant Professor, Medical Imaging Technology. B.S. (2003), B.S. (2004), Oregon Institute of Technology. Registered Vascular Technologist and Diagnostic Cardiac Sonographer (2005) ARDMS; M.S. (2016), University of Nebraska Kearney.

David K. Hammond (2013), Associate Professor, Mathematics. B.S. (1999), California Institute of Technology; Ph.D. (2007), New York University.

Christopher Hamper (2012), Instructor, Emergency Medical Services. A.A.S. (2010), Oregon Health and Science University/Oregon Institute of Technology; B.S. (2017), Portland State

University/Oregon Health and Science University.

Paula Hannan (2019), Instructor, Computer Systems Engineering Technology.

Michael Healy (2016), Assistant Professor, Computer Systems Engineering Technology. A.S. Electronic Systems Technology (1987), Community College of the Air Force; B.S.E.E. (1992), Northeastern University, Boston; M.B.A. (1998), University of New Mexico.

Cecily Heiner (2019), Assistant Professor, Computer Systems Engineering Technology. B.S. (2003), Brigham Young University; M.S. (2005), Carnegie Mellon University; Ph.D. (2009), University of Utah.

Paula Hendrix (2019), Associate Professor, Dental Hygiene. B.S. (1985), Oregon Health Sciences University; M.E. (2013), Concordia University.

Suzanne D. Hopper (2005), Professor, Dental Hygiene. A.A.S. (1981), B.S. (1999), Oregon Institute of Technology; M.A. (2006), University of Phoenix.

Eklas Hossain (2015), Assistant Professor, Electrical Engineering and Renewable Energy.

Philip Howard (2014), Associate Professor, Computer Systems Engineering Technology. B.S. (1982), B.A. (1982), Central Washington University; Graduate Certificate (1988), Multnomah School of the Bible; Ph.D. (2012), Portland State University.

Franny Howes (2014), Associate Professor, Communication. B.A. (2006), M.A. (2010), Michigan State University; Ph.D. (2014), Virginia Polytechnic Institute and State University.

Richard G. Hoylman (2002), Professor, Medical Imaging Technology. B.S. (1988), Oregon Institute of Technology; M.M. (2006), Southern Oregon University. Certified Nuclear Medicine Technologist (CNMT).

Alishia Huntoon (2005), Professor, Humanities and Social Sciences. B.S. (1999), University of Wisconsin, Stevens Point; M.S. (2002), Ph.D. (2005), Washington State University.

Janette A. Isaacson (1994), Associate Professor, Distance Education. A.S. (1984), Spokane Community College; B.S. (2005), Oregon Institute of Technology; M.Ed. (1998), University of Phoenix; M.Ed. (2002), Ed.D. (2002), Seattle University. RVT, RDCS, FSVU, LMHC.

Hugh E. Jarrard (2013), Assistant Professor, Emergency Medical Services. A.A.S. (2009), Oregon Health and Science University/Oregon Institute of Technology; B.S. (1984), Haverford College; Ph.D. (1997), University of Oregon.

Teshome Edae Jiru (2011), Associate Professor, Electrical Engineering and Renewable Energy. B.S. (1995), Addis Ababa University, Ethiopia; M.S. (2001), Catholic University of Leuven, Belgium; Ph.D. (2006), Concordia University, Canada.

David Johnston (2018), Instructor, Natural Sciences. B.S. (2006), Binghamton University; M.S. (2008), The College of William & Mary; Ph.D. (2017), The College of William & Mary.

Leah Jolly (2014), Associate Professor, Medical Imaging Technology. B.S. (2003), Oregon Institute of Technology. Registered Vascular Technologist (RVT) and Registered Phlebology Sonographer (RPhS).

Jherime L. Kellermann (2013), Assistant Professor, Natural Sciences. B.A. (1998), Penn State University; M.S. (2007), Humboldt State University; Ph.D. (2012), University of Arizona.

Jamie Kennel (2010), Associate Professor, Emergency Medical Services. A.A.S. (2009), Oregon Health and Science University/Oregon Institute of Technology; B.S. (1996), Ferris State University; M.S. (2011), Embry- Riddle Aeronautical University.

Maria Lynn Kessler (2002), Professor, Humanities and Social Sciences. B.S. (1983), Northeastern University; M.S. (1989), Southern Illinois University, Carbondale; Ph.D. (1994), Florida State University.

Jesse M. Kinder (2016), Assistant Professor, Natural Sciences. B.A. (2001), Depauw University; M.S. (2004) University of Pennsylvania; Ph.D. (2008) University of Pennsylvania.

Grant C. Kirby (2003), Associate Professor, Management. B.S. (1987), Oregon Institute of Technology; M.B.A. (1999), University of Oregon; M.S. (2013), Portland State University; Graduate Certificate, M.S. (2013), Portland State University.

Eve Klopf (2014), Associate Professor, Program Director, Electrical Engineering and Renewable Energy. B.S. (2002), Texas A&M University; M.S. (2008), Ph.D. (2011), Colorado State University.

Veronica Koehn (2012), Associate Professor, Communication. B.A. (2001), M.A. (2002), University of Colorado at Denver; Ph.D. (2010), University of Denver.

Bobbi Kowash (2010), Assistant Professor, Medical Imaging Technology. B.S. (1999), Oregon Institute of Technology; MHSc (2017), NOVA Southeastern University.

Karen E. Kunz (2001), Associate Professor, Head of Systems and Technical Services, Library Services. B.S. (1978), Oregon State University; M.L.S. (1997), Emporia State University.

Amber Lancaster (2018), Assistant Professor, Communication. B.A. (1999), University of Alaska Anchorage; M.A. (2003), University of Alaska Anchorage; Ph.D. (2008), Texas Tech University.

Dongbin (Don) Lee (2013), Associate Professor, Manufacturing and Mechanical Engineering and Technology. B.S. (1992), M.S. (2000), Kwangwoon University; Ph.D. (2009), Clemson University.

Hui Yun Li (2006), Professor, Natural Sciences. B.S. (1988), National Taiwan University; M.S. (1990), Michigan State University; Ph.D. (1994), University of Massachusetts, Amherst.

Roger V. Lindgren (1999), Professor, Civil Engineering. Dip1H. (1985), Northern Alberta Institute of Technology; B.Sc. (1989), University of Alberta; Ph.D. (2005), Portland State University. Registered Professional Engineer: Alberta, Nevada.

Gary Lomprey (2019), Assistant Professor, Management. B.S. (2005), Northwest Christian University; M.S. (2008), University of Oregon.

Dawn Lowe-Wincentsen (2008), Professor, Head of Portland-Metro and Extension Library Services, Creative Writing. B.A. (2000), Linfield College; M.L.I.S. (2003), Louisiana State University.

Jessica Luebbers (2015), Assistant Professor, Dental Hygiene. A.A.S. (2010), Portland Community College; B.S. (2012), Oregon Institute of Technology; M.S. (2017), Idaho State University; Ed.D. (In progress), George Fox University.

Travis J. Lund (2014), Associate Professor, Natural Sciences. B.S. (2006), George Fox University; Ph.D. (2013), University of Colorado Boulder.

Kari J. Lundgren (2014), Associate Professor, Communication. B.A. (2004), Franciscan University of Steubenville; M.A. (2006), Ph.D. (2013), Carnegie Mellon University.

Douglas W. Lynn (1996), Professor, Computer Systems Engineering

Technology. B.S. (1982), M.E. (1985), Ph.D. (1988), Brigham Young University.

Ryan Madden (2010), Associate Professor, Humanities and Social Sciences. B.A. (1984), University of California – Davis; M.A. (1988), University of Vermont; Ph.D. (1993), University of New Hampshire.

Mason K. Marker (2003), Professor, Geomatics. B.S. (1995), M.S. (1998), Oregon State University. Professional Land Surveyor: Oregon.

Rosalind J. McClure (2000), Professor, Natural Sciences. B.S. (1986), Oregon Institute of Technology; M.S. (2010), University of North Dakota.

Debbie L. McCollam (1995), Professor, Medical Imaging Technology. B.S. (1990), Oregon Institute of Technology; M.B.A. (1996), Southern Oregon University. Registered Technologist (R, M, ARRT).

Andrea McCracken (2019), Instructor, Communication.

Don McDonnell (2007), Associate Professor, Medical Imaging Technology. B.S. (1997), Oregon Institute of Technology; M.Ed. (2012), Western Governors University. Registered Technologist (R, ARRT).

Tatiana V. McVay (2001), Professor, Natural Sciences and Medical Imaging Technology. M.D. (1994), Moscow Medical Academy; B.S. (2000), Oregon Institute of Technology.

Nathan D. Mead (1998), Professor, Oregon Tech–Seattle at Boeing, Manufacturing and Mechanical Engineering and Technology. B.S. (1989), M.S. (1991), Oregon State University; Ph.D. (1998), University of Utah.

Robert F. Melendy (2017), Associate Professor, Electrical Engineering and Renewable Energy. B.S. (1992), M.S. (1994), M.S. (1998), Ph.D. (2008), Oregon State University.

Amr Metwally (2018), Instructor, Electrical Engineering and Renewable Energy Engineering.

Carmen Morgan (1989), Associate Professor, Management. A.A. (1984), B.S. (1986), Oregon Institute of Technology; M.B.A. (1991), Portland State University. Certified Public Accountant: Oregon; Certified Management Accountant; Certified in Financial Management, Personal Financial Specialist.

Mike Myers (2016), Associate Professor, Manufacturing and Mechanical Engineering and Technology. B.S.A.E. (1984), University of Kansas; Ph.D. (2012), Vanderbilt University; Teaching Certificate (2012); Vanderbilt University.

Mark Nardin (2018), Professor of Practice, Electrical Engineering and Renewable Energy.

Sophie Nathenson (2012), Associate Professor, Medical Sociology, Humanities and Social Sciences. B.S. (2006), University of Tulsa; M.S. (2009), Ph.D. (2012), University of Utah.

Cristina Negoita (2004), Professor, Mathematics. B.A. (1995), University of Oregon; M.S. (2002), Ph.D. (2003), Arizona State University.

Hallie A. Neupert (1999), Professor, Management. B.A. (1994), Wellesley College; M.S. (1996), University of Arizona.

Mark A. Neupert (1998), Professor, Humanities and Social Sciences. B.A. (1987), University of Colorado, Boulder; M.S. (1992), Ph.D. (1999), University of Arizona.

Phong Nguyen (1999), Assistant Professor, Computer Systems Engineering Technology. B.S.E.E. (1985), United States Naval Academy; M.S.E.E. (1992), Naval Post Graduate School, Monterey.

Peter Overholser (2018), Instructor, Applied Mathematics.

Rosanna Overholser (2017), Assistant Professor, Applied Mathematics. B.S. (2006), California Polytechnic State University; M.S. (2008), Ph.D. (2013), University of California, San Diego.

Gregory Pak (2010), Associate Professor, Natural Sciences. B.S. (1992), University of Illinois at Urbana-Champaign; B.S. (1994), Illinois Institute of Technology; M.D. (2001), Jagiellonian Collegium Medicum.

Jeffrey Pardy (2009), Associate Professor, Respiratory Care and Sleep Health. A.S. (1994), Rogue Community College; B.S. (2001), Regis University; M.B.A. (2012), Southern Oregon University.

Lloyd Parratt (2010), Associate Professor, Natural Sciences. B.S. (1972), University of Redlands; M.S. (1974), University of Wyoming.

Randall D. Paul (2004), Professor, Mathematics. B.A. (1989), Rice University; M.S. (1998), Ph.D. (1998), University of Texas at Austin.

Robert Paxton (2017), Associate Professor, Manufacturing and Mechanical Engineering and Technology. B.S. (2000), University of Waikato; Ph.D. (2006), Auckland University of Technology.

Trevor J. Petersen (2013), Associate Professor, Humanities and Social Sciences. B.S. (2006), Brigham Young University; M.S. (2009), Ph.D. (2013), Ohio University.

Dan Peterson (2007), Interim Dean, College of Health, Arts, and Sciences. Professor, Communication. B.A. (1996), M.A. (1999), Brigham Young University; Ph.D. (2002), Ohio University.

Slobodan Petrovic (2009), Professor, Electrical Engineering and Renewable Energy. B.S. (1979), University of Belgrade, Serbia; Ph.D. (1984), Technical University of Dresden, Germany.

Kevin Pintong (2014), Associate Professor, Computer Systems Engineering Technology. B.S. (2010), Binghamton University; M.S. (2012), Binghamton University.

Alla V. Powers (2004), Associate Professor, Digital Initiatives Librarian, Library Services. B.A. (1985), Karelian State Pedagogical Institute; M.S. (1993), Karelian College of Culture; M.L.I.S. (2009), Drexel University.

Scott Prahl (2012), Professor, Electrical Engineering and Renewable Energy. B.S. (1982), California Institute of Technology; Ph.D. (1988), University of Texas at Austin.

Bren Raffaelly (2017), Professor of Practice, Management. B.S. (1995), Southern Illinois University, Carbondale; M.B.A. (1998), University of Phoenix.

Joseph Reid (2009), Associate Professor, Mathematics. B.S. (2006), Western Oregon University; B.S. (2008), Oregon Institute of Technology; M.S. (2009), University of Washington; M.A.S. (2013), Penn State University.

Charles "C. J." E. Riley (2008), Professor, Civil Engineering. B.S. (2001), Swarthmore College; M.S. (2003), Ph.D. (2009), Colorado State University, Ft. Collins. Registered Professional Engineer: Oregon.

John A. Ritter (1996), Professor, Geomatics. B.A. (1976), University of California, Los Angeles; M.S. (1977), Ph.D. (1983), University of Michigan, Ann Arbor.

Wendy Rogers (2018), Instructor, Medical Imaging Technology. B.S. (1993), Oregon Institute of Technology.

Yasha Rohwer (2013), Associate Professor, Humanities and Social Sciences. B.A. (2000), University of Washington; M.A. (2006), Florida State University; M.A. (2009), Ph.D. (2012), University of Missouri.

Paula Russell (2011), Associate Professor, Dental Hygiene. B.S. (1998), Oregon Institute of Technology; M.Ed. (2010),

University of Phoenix. Expanded Practice Dental Hygienist (EPDH).

Mostafa Saber (2017), Associate Professor, Manufacturing and Mechanical Engineering and Technology. B.S. (2001), Sharif University of Technology; M.S. (2003), University of Tehran; Ph.D. (2013), North Carolina State University.

Troy Scevers (2013), Associate Professor, Computer Systems Engineering Technology. B.S. (1997), M.S. (2002), Oregon Institute of Technology.

Patrick Schaeffer (2009), Associate Professor, Management. B.S. (1986), M.S. (1994), San Jose State University.

Elvira Schechtel (1990), Professor, Natural Sciences. B.S. (1982), Universidad Nacional de Asunción; M.S. (1995), Oregon Graduate Institute of Science and Technology.

Aaron Scher (2012), Associate Professor, Electrical Engineering and Renewable Energy. B.S. (2003), M.S. (2005), Texas A&M University, College Station; Ph.D. (2008), University of Colorado, Boulder.

Matthew W. Schnackenberg (2005), Professor, Communication. B.A. (1995), Michigan State University; M.A. (1998), Ph.D. (2006), Washington State University.

Heather Schudel (2019), Instructor, Dental Hygiene. B.S. (2000), Oregon Institute of Technology; M.A. (2018), Concordia University.

Stephen M. Schultz (1995), Professor, Medical Imaging Technology. B.S. (1983), M.S. (1994), State University of New York, Buffalo. B.S. (2009), Oregon Institute of Technology. R.T. (R) (N) (CT) ARRT.

Michael Schwartz (2007), Program Director, Sleep Health. M.A. (1992), San Francisco State University.

Robin Schwartz (1999), Assistant Professor, Communication. B.A. (1978), M.A. (1989), Western Washington University.

Matthew Search (2010), Associate Professor, Communication. M.A. (1999), University of Central Florida; Ph.D. (2010), Iowa State University.

Maureen Sevigny (1995), Professor, Management. B.A. (1976), Barnard College; M.B.A. (1978), New York University; Ph.D. (1995), University of Maryland.

Feng Shi (2011), Assistant Professor, Electrical Engineering and Renewable Energy. B.S. (1985), Northwest Normal University, P.R. China; MME (1991), Yunnan Normal University, P.R. China; M.S. (2002), University of Rochester; Ph.D. (2008), University of Toledo.

Hong "Randy" Y. Shih (1984), Professor, Manufacturing and Mechanical Engineering and Technology. B.S. (1979), Chung-Yuan University, Taiwan; M.S. (1984), University of Nebraska, Lincoln.

Matthew Sleep (2012), Associate Professor, Civil Engineering. B.S.G.E. (2004), University of Mississippi; M.S. (2006), Ph.D. (2011), Virginia Tech.

Sean Sloan (2010), Associate Professor, Manufacturing and Mechanical Engineering and Technology. B.S. (1989), M.S. (1994), University of Illinois.

Sean W. StClair (2004), Professor, Civil Engineering. A.S. (1996), Ricks College; B.S. (1998), Utah State University; M.S. (2000); Ph.D. (2004), Georgia Institute of Technology. Registered Professional Engineer: Oregon.

Lisa Steinbock (2016), Instructor, Medical Imaging Technology. B.S. (2005), Oregon Institute of Technology; B.S. (2011), Weber State University. Registered Technologist (R) (CT) (T) (ARRT).

Lindy Stewart (2015), Assistant Professor, Management. B.S. (2012), Oregon Institute of Technology; M.S. (2015), Boston University.

Clifford Stover (2017), Associate Professor, Manufacturing and Mechanical Engineering and Technology. B.S. (1992), M.S. (1995), Cal Poly Pomona.

Wangping Sun (2005), Professor, Manufacturing and Mechanical Engineering and Technology. B.S. (1988), Beijing Jiaotong University; M.S. (2002), Ph.D. (2005), Kansas State University.

Darlene J. Swigart (2017), Assistant Professor, Dental Hygiene. B.S. (1998), Idaho State University.

Christopher J. Syrnyk (2012), Associate Professor, Communication. Director, Oregon Tech Honors Program. B.A. (1991), M.A. (1998), University of Oregon; M.A. (2000), Virginia Polytechnic Institute and State University; Ph.D. and Ph.D. Minor (2016), University of Wisconsin-Madison.

Dawn Taylor (2010), Associate Professor, Medical Laboratory Science. B.S. (1986), Illinois State University; Ed.M. (2014), Oregon State University. M.T. (A.S.C.P.) certified.

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Kenneth C. Usher (2000), Professor, Natural Sciences. B.S. (1990), University of Alberta; Ph.D. (1996), University of Oregon.

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Chitra Venugopal (2018), Assistant Professor, Electrical Engineering and Renewable Energy.

Adam Wagner (2010), Instructor, Emergency Medical Services. A.A.S. (2009), Oregon Health and Science University/ Oregon Institute of Technology; B.A. (2003), B.S. (2003), University of Montana.

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Elizabeth Wells (2018), Instructor, Dental Hygiene. B.S. (2014), Oregon Institute of Technology.

Robyn S. Wilde (2002), Professor, Natural Sciences. B.S. (1994), Utah State University; M.S. (1996), Ph.D. (2000), University of Nebraska, Lincoln.

Tonja Willey (2016), Assistant Professor, Dental Hygiene (Salem). A.A.S. (1989), Mt. Hood Community College; B.S. (2011), Oregon Institute of Technology; M.S. (2013), Portland State University.

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Laurie Yates (2015), Instructor, Management. B.A. (1973), Portland State University; M.B.A. (2002), University of Oregon; DMgt (2011), George Fox University.

Faculty Senate Presidents

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1977-1978 Robert C. DeRosier
1978-1979 Richard H. Zbinden
1979-1980 Gary E. Wehr
1980-1981 Keith L. Spickler
1981-1982 Earl D. Kurtz
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1984-1985 Edward Silling
1985-1987 Herbert H. Jolliff
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1989-1990 Pearl O. Juris
1990-1991 John V. Stec
1991-1993 James R. Etchison
1993-1995 Bradley D. Burda
1995-1997 Valerie J. Vance
1997-1999 David C. Warner
1999-2000 Alberto Bello, Jr.
2000-2002 Mark Clark
2002-2003 Timothy Thompson
2003-2006 Bradley D. Burda
2006-2008 Mark Neupert
2008-2009 Marla Miller
2009-2010 Debbie Caldwell
2010-2012 Matt Schnackenberg
2012-2014 Dan Peterson
2014-2016 Robyn Cole
2016-2018 David Thaemert
2018-Present Terri Torres

Emeritus Faculty

Marshall Ager, B.S., Assistant Professor, Civil Engineering and Geomatics, 1977-2004.

Randal Albert, M.S., Computer Systems Engineering Technology, 1984-2013.

Robert E. Baird, E.E., Professor, Electrical Engineering and Renewable Energy, 1958-1979.

Lynda M. Baker, M.F.A., Professor, Humanities and Social Sciences, 1989-2012.

James Ballard, Ed.D., Associate Professor, Mathematics, 2000-2016.

William Bradford, M.S., Professor, Medical Laboratory Technology, 1960-1986.

Judy Bronkey, M.A., Associate Professor, Director, Ethnic and International Student Services, 1969-1995.

Gene Bruner, M.S., Professor, Electrical Engineering and Renewable Energy, 1982-2004.

Ralph Carestia, M.S., Computer Systems Engineering Technology, 1990-2013.

Ross Carroll, Ph.D., Professor of Communication, 1984-2003.

Thomas J. Connors, Ph.D., Professor and Vascular Technology Program Director, 1969-1999.

Harriet Cornachione, M.S., Professor, Civil Engineering, 1995-2010.

Michael Cornachione, M.S., Professor, Civil Engineering, 1992-2010.

Ben Cornelius, M.A., Mathematics, 1980-2013.

Jesse Crabtree, Assistant Professor, Civil Engineering Technology, 1947-1976.

G. Gene Culver, B.S., Associate Professor, Associate Director, Geo-Heat Center, 1960-1995.

Hugh Currin, Ph.D., Manufacturing and Mechanical Engineering Technology, 1984-2013.

W.M. Douglass, M.Ed., Professor and Dean of Administration, 1954-1983.

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David Dyrud, Ph.D., Professor of Communication, 1975-2003.

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Marian Ewell, B.S., Assistant Professor, Allied Health Partnerships, Clinical Laboratory Science, 2001-2012.

Jeanne Ford, R.N., Assistant Professor, Administrative Director, Student Health Service, 1964-1983.

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James R. Gerhardt, M.S., Professor, Medical Imaging Technology, 1967-1992.

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Margaret Huntley, Professor, Management, 1975-2006.

Herbert H. Jolliff, M.S., Professor and Department Chair, Mathematics, 1968-1999.

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Pearl O. Juris, M.S., Professor, Nursing, 1977-1992.

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Arthur LeCours, M.Ed., Professor, Physics, 1959-1982.

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Susan K. Snyder, M.S., Professor, Physical Education, 1964-1995.

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James V. Stewart, M.Ed., Professor, Mathematics, 1984-2002.

Charles R. (Dick) Strohkirch, M.S., Professor, Medical Imaging Technology, 1972-1998.

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Edward R. Stuedli, D.D.S., Professor, Dental Hygiene, 1976-1998.

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Ron McCutcheon, B.A., Chief Human Resources and Civil Rights/Diversity Officer, 1996-2016.

Cheryl Meyers, Executive Assistant, Provost and Vice President of Academic Affairs, 1989-2015.

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Beth Murphy, M.S., Assessment, 1990-2010.

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Douglas P. Yates, Ed.D., Vice President for Finance and Administration, 1980-2002.

Betty J. Young, Office Manager, Business Office, 1961-1999.

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