Welcome to OIT

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User’s Guide
To assist you in navigating the 2009-10 General Catalog, we have organized its contents into nine major areas. We have added a general content description of each area. The index at the end of this catalog can help in locating specific information. The general catalog is printed annually and available on the Web at www.oit.edu.

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General Information

The OIT Admissions Office is located on the first floor of the College Union on the Klamath Falls campus. It is open weekdays from 8 a.m. to 5 p.m. to serve prospective students, applicants and their families, as well as high school guidance counselors, college-transfer advisers 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 hall 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 e-mailing oit@oit.edu. If you wish to visit one of OIT’s other campuses, the Admissions Office can provide you with a contact person who can make arrangements for you.

Non-Discrimination Policy
Oregon Institute of Technology 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 person is designated to handle inquiries and complaints regarding this non-discrimination policy: Affirmative Action Officer, OIT, 3201 Campus Dr., Klamath Falls, OR 97601-8801; (541) 885-1108; FAX (541) 851-5200; e-mail: ron.mccutcheon@oit.edu.

Students with Disabilities
Oregon Institute of Technology is committed to accommodating the academic and programmatic needs of qualified students with disabilities. Students with disabilities who anticipate needing accommodations should contact Services for Students with Disabilities, LRC 223, as soon as possible in advance of enrollment, to ensure timely provision of services. Questions may be directed to: Services for Students with Disabilities, OIT, 3201 Campus Dr., Klamath Falls, OR 97601-8801. (541) 885-1129; e-mail: joan.loustalet@oit.edu.

Alternate Format
This publication is available in alternate format for persons with disabilities. Please contact Services for Students with Disabilities at (541) 885-1129 or joan.loustalet@oit.edu.

Accreditation
Oregon Institute of Technology 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, OIT, 3201 Campus Dr., Klamath Falls, OR 97601-8801.

General Catalog Production
The 2009-10 General Catalog was produced by the Public Relations Office, Valeree Lane, director and Kristina Maupin, public information representative; and the Registrar’s Office, Marla Edge, registrar and Crystal Pound, registration specialist. Catalog cover design and typesetting by Susun Cooper, Rocky Ridge Specialties. 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 OIT and the student or applicant. The general catalog is printed annually and available on the Web at www.oit.edu.
President’s Welcome

Welcome to the OIT Family. You are embarking upon one of the most exciting educational opportunities available during a time of profound change in our society.

Our locations in Klamath Falls, La Grande, Portland, and Seattle are home to numerous student groups and organized activities. Everyone at OIT is proud of our students’ accomplishments. Equally important, we are small enough to allow students and faculty to really get to know each other. Each student will find a specific niche and welcoming environment at OIT.

Student success is our highest priority and is measured in a variety of ways: our impressive placement rates, starting salaries, and how well the university rates on graduate satisfaction surveys conducted regularly by the Oregon University System. We consistently rise to the top in the state university system, and about 92 percent of graduates recently reported their overall OIT experiences as either “excellent” or “very good.”

Our tagline, “Hands-on education for real-world achievement,” is more than a slogan—it truly is the way we do business. Our low student-to-faculty ratio of 19:1 allows for consistent, personal interactions between faculty and students. Faculty members bring their knowledge of industry into the classroom, and OIT students have myriad opportunities to gain real-world experience through externships, internships, cooperative programs, and capstone projects. Our applied approach to education is the main reason so many employers seek OIT alumni.

In choosing OIT you have made a decision about your education and your future that we know will be filled with learning, success, satisfaction, and a lifelong connection to the university. And as glad as we all are that you chose OIT to continue your education, I do look forward to handing you a diploma and following your successes throughout your post-OIT career. Again, welcome to the OIT Family – we’re glad you’re here!

Best wishes,
Chris Maples

Mission and Objectives

Preamble
As the Oregon University System (OUS) institution with a focused mission to deliver technology education statewide, Oregon Institute of Technology (OIT) develops and maintains partnerships with public and private institutions, businesses and industries, healthcare organizations and government agencies to ensure quality programs that meet the needs of students and the organizations that employ them. Increasingly, OIT is participating in initiatives to increase access to its technology programs by sharing facilities and human resources with other OUS institutions and community colleges throughout the state.

Mission Statement
Oregon Institute of Technology, the only public institute of technology in the Pacific Northwest, provides degree programs in engineering and health technologies, management, communications and applied sciences that prepare students to be effective participants in their professional, public and international communities. Six objectives are central to our mission:

1. Provide degree programs that enable graduates to obtain the knowledge and skills necessary for immediate employment.
2. Enable students to be effective communicators, responsible citizens and lifelong learners by assisting them in the development of critical thinking and problem solving skills, and ethical and cultural awareness.
3. Offer continuing and distance education and advanced professional studies to meet the emerging needs of today’s citizens.
4. Provide informational and technical expertise to regional, state, national and global publics in applied research.
5. Develop and maintain partnerships with public and private institutions, business and industry, and government agencies to ensure quality programs that meet the needs of students and the organizations that employ them.
6. Provide statewide access to address the needs of the Oregon workforce.

This statement of mission and objectives for OIT was approved by the State Board of Higher Education on Dec. 19, 1999.
Academic Calendar 2009-10

Fall Term, 2009
MAY 11-21 .............................................................. Registration for Fall Term
SEP 23-24 .............................................................. Registration for those not registered in advance
(SEP 25-27 .............................................................. New student orientation
SEP 28 .............................................................. Classes begin
SEP 28-OCT 2 .............................................................. Fee payment
SEP 29 .............................................................. Last day to use WebREG for registration, add/drops
OCT 2 .............................................................. Last day to pay fees or register without late charge
OCT 9 .............................................................. Last day to add/register or drop with no record*
NOV 9-20 .............................................................. Registration for Winter Term
NOV 11 .............................................................. Veterans Day holiday
NOV 13 .............................................................. Last day to withdraw with a “W”*
NOV 25 (1:00 p.m.)–NOV 29 .............................................................. Thanksgiving holiday
DEC 7-10 .............................................................. Final exams week
DEC 11 .............................................................. Fall Term ends

Winter Term, 2010
NOV 9-20, 2009 .............................................................. Registration for Winter Term
JAN 1 .............................................................. New Year’s holiday
JAN 4 .............................................................. Registration and orientation for new students
JAN 4 .............................................................. Classes begin
JAN 4-8 .............................................................. Fee payment
JAN 5 .............................................................. Last day to use WebREG for registration, add/drops
JAN 8 .............................................................. Last day to pay fees or register without late charge
JAN 15 .............................................................. Last day to add/register or drop with no record*
JAN 18 .............................................................. Martin Luther King, Jr. holiday
FEB 15-25 .............................................................. Registration for Spring Term
FEB 19 .............................................................. Last day to withdraw with a “W”*
MAR 15-18 .............................................................. Final exams week
MAR 19 .............................................................. Winter Term ends

Spring Term, 2010
FEB 15-25 .............................................................. Registration for Spring Term
MAR 29 .............................................................. Registration and orientation for new students
MAR 29 .............................................................. Classes begin
MAR 29–APR 2 .............................................................. Fee payment
MAR 30 .............................................................. Last day to use WebREG for registration, add/drops
APR 2 .............................................................. Last day to pay fees or register without late charge
APR 9 .............................................................. Last day to add/register or drop with no record*
MAY 3 .............................................................. Registration for Summer Term for all students begins
MAY 10-20 .............................................................. Registration for Fall Term
MAY 14 .............................................................. Last day to withdraw with a “W”*
MAY 31 .............................................................. Memorial Day holiday
JUN 7-10 .............................................................. Final exams week
JUN 11 .............................................................. Spring Term ends
JUN 12 .............................................................. Commencement

Summer Term, 2010 (8-week session)
MAY 3 .............................................................. Registration for all students begins
JUN 21 .............................................................. Classes begin
AUG 13 .............................................................. Summer Term ends

First 4-week Session
JUN 21 .............................................................. Classes begin
JUL 16 .............................................................. First 4-week Session ends

Second 4-week Session
JUL 19 .............................................................. Classes begin
AUG 13 .............................................................. Second 4-week Session ends

*Instructor and adviser permission required on or after the third day of classes.
Additional calendars can be viewed at: www.oit.edu.
Oregon Institute of Technology is Oregon’s only public institution of higher education with a mission to deliver technology education throughout the Pacific Northwest. We partner with business and industry leaders to ensure our programs adapt to new technologies and workforce demands. This real-world focus gives our students a competitive edge: 95 percent are employed or in graduate school within six months of graduation. Many have offers before graduation. Year after year, our baccalaureate graduates earn excellent starting salaries.

Our applied approach to teaching, which blends theory and practice, is the main reason our alumni are so avidly recruited. Whether they study software engineering, vascular technology, management or dental hygiene, OIT students have amazing opportunities to apply what they learn in lab-based classes, clinics, externships and workplaces. This practical focus is reinforced in the classroom by instructors who come to OIT with relevant business, industrial or clinical experience.

And in every program, major studies are underscored by a general-education core that broadens students’ understanding of the world and teaches them to communicate effectively, solve problems and think for themselves.

At OIT, students find a robust university atmosphere personalized by individual interactions with professors and staff. An enrollment of about 3,300 allows for an intimate campus environment distinguished by small classes and a student-to-faculty ratio of 19:1. This personal approach provides many benefits of a prestigious private education at a public price. Specific learning communities and seminars are in place to smooth the transition to college life and to promote students’ academic and personal success.

OIT, a public, state-supported institution belonging to the Oregon University System, is accredited by the Northwest Commission on Colleges and Universities. Individual programs also are accredited by the appropriate professional organizations.

**One OIT, many locations**

OIT is one institution with many locations. Established in 1947, OIT offers degree programs at our main campus in Klamath Falls, four Portland locations, in partnership with the Oregon Dental Service Companies and Eastern Oregon University in La Grande, and in partnership with The Boeing Company in Seattle. We also offer online programs through the Distance Education department.

Most OIT classes are taught at our main campus in Klamath Falls. 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 20,000 residents (45,000 in the urban growth area), is located in south-central Oregon, about 20 miles from the California border. Known as Oregon’s “City of Sunshine,” Klamath Falls enjoys about 300 days of blue skies each year. The region offers a variety of dramatic and varied landscapes to be enjoyed by everyone—whether whitewater rafting on the Klamath River, spelunking at Lava Beds National Monument, visiting seven National Wildlife Preserves or magnificent Crater Lake. Superlative spots for fishing, golf, skiing, hiking, backpacking and horseback riding are just minutes from campus along the Volcanic Legacy Scenic Byway. Entertainment activities and venues abound: neighborhood parks, ice skating, bowling, a skatepark, coffee houses, restaurants and a 10-screen movie theater all add enjoyment to the relaxed pace of Klamath Falls life. Those more drawn to cultural pursuits will find art galleries, museums, a symphony orchestra and the top-rated Ross Ragland Theater, showcasing national and regional acts as well as community productions. The Oregon Shakespeare Festival and the Britt Festival offer world-class seasonal entertainment just 90 minutes away.

By contrast, Portland is the metropolitan center of Oregon, located at the north end of the state. At a population of about 575,000 (about 2 million in the metropolitan area), typical amenities of city life abound, surrounded by the region’s lush beauty. A bustling local scene, an eco-friendly light rail system, parks, galleries, nightlife and much more make Portland appealing to locals and visitors alike.
Essential Learning Outcomes for OIT Students

OIT students will demonstrate these institutional student learning outcomes:

- Effective oral, written and visual communication
- The ability to work effectively in teams and/or groups
- An understanding of professionalism and ethical practice
- Critical thinking and problem solving
- Lifelong and independent learning skills
- Mathematical knowledge and skills
- Scientific knowledge and skills in scientific reasoning
- Cultural awareness

Degree Programs

Master of Science

Civil Engineering
Manufacturing Engineering Technology

Bachelor of Science

Allied Health Management
Applied Mathematics
Applied Psychology
Biology
Civil Engineering
Clinical Laboratory Science (joint degree with OHSU)
Communication Studies
Computer Engineering Technology
Dental Hygiene
Diagnostic Medical Sonography
Echocardiography
Electrical Engineering
Electronics Engineering Technology
Embedded Systems Engineering Technology
Environmental Sciences
Geomatics, with options in:
  - Geographic Information Systems
  - Surveying
Health Sciences
Information Technology, with options in:
  - Accounting
  - Applications Development
  - Business/Systems Analysis
  - Health Informatics

Management, with options in:
  - Accounting
  - Entrepreneurship/Small Business Management
  - Marketing
  - Manufacturing Engineering Technology
  - Mechanical Engineering
  - Mechanical Engineering Technology
  - Nuclear Medicine Technology
  - Nursing (through OHSU, School of Nursing)
  - Operations Management
  - Radiologic Science
  - Renewable Energy Engineering
  - Respiratory Care
  - Software Engineering Technology
  - Vascular Technology

Associate Degrees

Associate of Applied Science

Dental Hygiene
Emergency Medical Technology–Paramedic (joint degree with OHSU)
Polysomnographic Technology

Associate of Engineering

Computer Engineering Technology
Software Engineering Technology
History at a Glance

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

1951 – KTEC radio went on the air.

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 on campus.

1957 – The institute 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 – The institute was transferred to the jurisdiction of the State Board of Higher Education.

1962 – The institute was accredited by the Northwest Association of Secondary and Higher Schools.

1964 – The campus moved to newly constructed buildings on a geothermal site overlooking Upper Klamath Lake.

1966 – The institute received authorization to grant bachelor’s degrees.

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

1975 – Geo-Heat Center established.

1976 – Kenneth Light appointed President upon Purvine’s retirement.

1983 – Larry Blake appointed President and the Metro Center was established in Portland.

1984 – Small Business Development Center established.

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

1989 – State Board authorized OIT to grant master degrees.

1991 – Lawrence J. Wolf appointed President.

1995 – Master’s degree first offered.

1998 – Martha Anne Dow appointed President.

2001 – Oregon Renewable Energy Center established.

2005 – Oregon Center for Health Professions established.

2008 – Christopher G. Maples appointed President.

Campus Map

1. Snell Hall
   Administrative Offices, Alumni Relations, Cashier, Human Resources, Oregon Tech Foundation, Registrar

2. College Union
   Admissions, ASOIT, Bookstore, Financial Aid, Campus Dining, Information, Meeting Rooms, Post Office, Student Affairs

3. Residence Hall

4. Athletics
   Gymnasium, Pool, Fitness Center

5. Learning Resource Center
   Career Services, Center for Learning and Teaching, Counseling and Testing, Library, Media Services, Offices, Shaw Historical Library, Television Studio

6. Owens Hall
   Classrooms, Laboratories, Offices

7. Semon Hall
   Classrooms, Dental Clinic, Laboratories, Offices, Student Health Center

8. Boivin Hall
   Classrooms, Computing Services, Geo-Heat Center, Offices, Small Business Development Center

9. Purvine Hall
   Classrooms, Laboratories, Offices

10. Cornett Hall
    Classrooms, Laboratories, Offices

11. John F. Moehl Stadium and Track Facility

12. Facilities Services
    Central Receiving

13. Information Center
    Disabled Parking Information, Temporary and Visitor Parking Permits, Campus Security

14. Commons

15. Martha Anne Dow Center for Health Professions
    Classrooms, Laboratories, Offices

16. Miller Hall

17. Sustainable Village
Notes
Admissions and Financial Aid
Office of Admissions

Ginny Gardiner, Interim Director of Admissions
Abbie Allen, Admissions Associate (Portland East)
Deborah Brainard, Campus Visit Coordinator
Carleen Drago, Student Services Specialist (Portland West)
Pamela McIntire, Admissions Counselor
Kathy Starkey, Office Manager
Brenda Williams, Admissions Counselor

College Union, 1st Floor
(541) 885-1150
(541) 885-1024 - fax
oit@oit.edu

The OIT 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 OIT, 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.

Those interested in seeing the Klamath Falls campus should contact the Admissions Office. A visit coordinator can arrange meetings with a faculty member and admissions counselor, plan a tour of the residence hall and entire campus, schedule an appointment to chat with a coach or sit in on a class. To set up a campus visit, call (800) 422-2017, ext. 1. Hearing impaired persons may call the TTY number (541) 885-1072. Request a campus visit online at www.oit.edu/visit. To visit one of OIT’s other sites, contact the Admissions Office to receive appropriate contact information.

Application Procedures
All students who wish to take more than eight credits in a term, receive financial aid and/or graduate from OIT, must apply and be accepted for admission. OIT strongly encourages students to submit all application materials nine to 12 months in advance of the term enrollment is scheduled to begin.

At a minimum, all documents should be filed at least one month prior to enrollment. Every applicant must complete the following steps:

1. Complete the Application for Admission and submit it to the Admissions Office. Note: Apply online at www.oit.edu/apply.
2. Submit the $50 non-refundable application fee. Checks or money orders should be made payable to OIT.
3. Those applicants who have earned fewer than 36 college credits must have official SAT I or ACT scores sent to OIT. 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 previously attended, or received credit from, sent directly to the OIT Admissions Office. Any offer of admission is contingent upon the submission of satisfactory final transcripts prior to enrollment at OIT.
5. Have official high school transcripts or GED test results sent directly to the OIT Admissions Office. High School records are not required from applicants who graduated prior to 1997 and who have earned at least 36 college 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 14 subject re-
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 Placement (AP) score reports sent to the OIT Admissions Office, if applicable.

Some programs at OIT do not have sufficient space to enroll all qualified applicants who seek admission. In these cases, OIT 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 OIT’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 five or fewer 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 OIT.

Social Security Number Disclosure and Consent Statement

Students are requested to provide voluntarily a Social Security Number (SSN) to assist OIT and the Oregon University System (and organizations conducting studies for or on behalf of OUS) 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. When conducting studies, OUS will disclose a student’s Social Security Number only in a manner that does not permit personal identification by individuals other than representatives of OUS (or the organization conducting the study for OUS) and only if the information is destroyed when no longer needed for the purposes for which the study was conducted. 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 law. Students may revoke consent for the use of a Social Security Number in these ways at any time by writing to: Office of the Registrar, OIT, 3201 Campus Dr., Klamath Falls, OR 97601.

However, OIT is required to obtain a Social Security Number in order to file certain returns with the Internal Revenue Service (IRS) and to furnish a statement to you. The returns that OIT 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 Procedures

Freshman Admission

Academic performance is not the sole criterion for admission. OIT may evaluate a person’s behavior and background to determine their ability to maintain the standards of academic and professional conduct expected at the university. An evaluation may take into consideration current behavior and performance as well as past experiences and actions. Simply qualifying for admission does not guarantee admission.

For admission to freshman standing, students must meet entrance requirements adopted by the State Board of Higher Education in Oregon. Applicants who are enrolled in or have graduated from regionally accredited high schools must:

1. Submit an official high school transcript. 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. Submit results from either the SAT Reasoning Exam, SAT I or ACT. Applicants may submit scores from SAT I or ACT tests taken prior to March 2005; but applicants taking the tests after that time must also submit results from the SAT Writing test or the optional ACT Writing exam.

a. Applicants with an unweighted cumulative high school grade point average of 3.00 or better do not need to meet a minimum SAT or ACT score.

b. Applicants with an unweighted GPA of 2.75 to 2.99 need to submit combined SAT Reasoning Exam scores of 800 or better on the Critical Reading (formerly called Verbal) and Math tests with a score of at least 400 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 need to submit combined SAT Reasoning Exam scores of 1000 or better on the Critical Reading (formerly called Verbal) and Math tests with a score of at least 500 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.

3. Applicants must satisfactorily (with grades of C- or above) complete at least 14 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 include the study of the English language, literature, speaking and listening, and writing, with emphasis on and frequent practice in writing expository prose during all four years.

b. Mathematics (3 units required, 4 strongly recommended). Shall include first-year algebra and two additional years of college preparatory mathematics such as geometry, probability and statistics, trigonometry, finite mathematics, advanced applications, calculus, and probability and statistics, or courses that integrate topics
Applicants who are unable to meet the 14 subject requirements may be eligible for admission by earning an average score of 470 or above (940 total) on two College Board SAT Subject Tests (in Math level I or IIC and another test of the student’s choice). Students who do not take a SAT Subject test in a second language must prove language proficiency through another approved process.

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 educated students and graduates of unaccredited or non-standard high schools, as well as applicants who fail to meet the 14 subject requirements, may be admitted by submitting SAT Reasoning Exam score of 1000 on the Math and Critical Reasoning sections combined and 470 on the Writing test or an ACT composite score of 21 or better and submitting an average score of 470 or above (940 total) on two College Board SAT Subject Tests (Math level I or IIC and another test of the student’s choice). An examination in a second language is strongly recommended to qualify the applicant for admission by meeting the language proficiency requirements. Students who do not take an SAT Subject test in a second language must prove language proficiency through another approved process.

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.

- 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 already, in which case, only a cumulative 2.0 GPA is required.
- In order to be admitted to OIT, transfer applicants must demonstrate proficiency in English and Math. One way to do this is by completing Math 95 Intermediate Algebra (or higher) and WRI 115 Introduction to Writing (or higher) with grades of “C-” or better.
- Applicants who do not have an OTM, Associate or Bachelor’s degree must have at least 33 college-level credits that are not in Physical Education. If more than 10 percent of an applicant’s credits are in Physical Education, those credits in excess of 10 percent may not be calculated in his or her cumulative college GPA.
- Applicants must be eligible to re-enroll in the previous institution attended.

Official transcripts from all postsecondary institutions must be submitted for consideration. Applicants who graduated from high school after 1996 must also submit official high school transcripts, unless they have completed two terms of college-level study in a second language.

Applicants with fewer than 36 term credit hours or who have not completed the math and writing course requirements must also provide high school transcripts or GED scores. Admission will be based on both high school and postsecondary records.

A Transfer Evaluation Report acknowledging the courses accepted by the university will be sent after admission status has been con-

Applicants who are unable to meet the 14 subject requirements may be eligible for admission by earning an average score of 470 or above (940 total) on two College Board SAT Subject Tests (in Math level I or IIC and another test of the student’s choice). Students who do not take a SAT Subject test in a second language must prove language proficiency through another approved process.

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- Applicants who do not have an OTM, Associate or Bachelor's degree must have at least 33 college-level credits that are not in Physical Education. If more than 10 percent of an applicant’s credits are in Physical Education, those credits in excess of 10 percent may not be calculated in his or her cumulative college GPA.
- Applicants must be eligible to re-enroll in the previous institution attended.

Official transcripts from all postsecondary institutions must be submitted for consideration. Applicants who graduated from high school after 1996 must also submit official high school transcripts, unless they have completed two terms of college-level study in a second language.

Applicants with fewer than 36 term credit hours or who have not completed the math and writing course requirements must also provide high school transcripts or GED scores. Admission will be based on both high school and postsecondary records.

A Transfer Evaluation Report acknowledging the courses accepted by the university will be sent after admission status has been con-
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 OIT. Articulation agreements give students a clear understanding of what courses will transfer to OIT 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 adviser 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 OIT major or by transfer institution. Questions regarding these agreements may be directed to the students’ academic department or the OIT Registrar’s Office.

Non-Admit Students
A non-admit is a student who wishes to take less than nine credit hours per term at OIT, is not seeking a degree from OIT and has never been fully admitted to OIT in the past. A non-admit is not eligible for financial aid. College-level classes taken while in non-admit status may be used toward OIT graduation requirements upon completion of the full admission process or may be transferred to other institutions. To enroll at OIT as a non-admit, submit the Non-Admit Application Form to the Admissions Office, preferably at least one week prior to enrollment. OIT reserves the right to deny enrollment opportunities 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
3. 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.

International Student Admission
International students play an important role in campus life, and the Admissions Office is available for admission assistance.

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 International Student Declaration of Finances 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 OIT.

A completed health history and immunization form and proof of adequate health and accident insurance also must be submitted. In addition to the health requirements that need to be fulfilled before registration, international students must have at least one documented MMR vaccine on file at the Student Health Center prior to the student attending any classes (per OAR 333-050-0130, ORS 433.282 and ORS 433.284). Refer to Student Health Center section of this catalog for health history and immunization requirements.

Admission Requirement Exception
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.

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.

ROAD (Registration, Opportunity and Discovery)
Registration for new students occurs in the summer and at the beginning of each term. All students who are new to the Klamath Falls campus must attend ROAD to register
for classes. In addition to placement testing and meeting with advisers to plan an academic schedule, students have the opportunity to register for classes, set up OIT computer and e-mail accounts, receive a university ID card and learn more about making a successful transition to OIT. Students are encouraged to attend ROAD during the summer, rather than waiting to register just prior to the beginning of fall term. Details of orientation activities are sent to all incoming students prior to the term. Fall term orientation is a comprehensive program that assists new students in a successful transition to university. The program involves workshops, forums and activities. Workshops addressing stress, time- and money-management are offered, as well as forums for students of color, non-traditional students and students with disabilities. Activities such as canoeing, rafting and rock-climbing instruction supplement the orientation and provide the opportunity to meet new people. Also offered are introductions to the various labs and departments on campus, such as the library, computer lab, fitness center and residence hall. Orientation also is designed to give new students a chance to meet and socialize with their professors before classes get underway. Orientation for winter and spring terms is condensed. Contact the Center for Learning and Teaching at (541) 885-1791 for more information.

Placement Examinations
All entering students must take a mathematics examination for placement into mathematics courses. Students who have earned college credit in calculus or who have completed the math requirements for their major are exempt. All entering students with fewer than 36 transferable college credits must take a reading assessment. Students who have earned college-level credit in writing are exempt from needing to take the writing-placement exam.

Placement tests are available prior to the term of entry and in conjunction with new student registration. For more information, contact the Center for Learning and Teaching at (541) 885-1791.

Financial Aid Programs and Application Process
Tracey Lehman, Director
College Union, 1st Floor
(541) 885-1280
dollars@oit.edu

The Financial Aid Office is committed to providing high-quality service to all students, their families and the community. As part of that commitment, the office strives to provide information that is accurate, easy to understand and enables students to make decisions regarding 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. OIT’s Financial Aid Award Guide serves that purpose and is sent to all new students. It is also available on our Web site at www.oit.edu/aid. Additional questions regarding the application process should be directed to the Financial Aid Office.

Federal law mandates that all students applying for financial aid complete the Free Application for Federal Student Aid (FAFSA) and list OIT’s school code (003211). Feb. 1 is OIT’s priority deadline. FAFSA information must be submitted to the federal processor and a valid ISIR processed by that date in order for students to be considered for their maximum eligibility. Students who file after that date will still have eligibility; however, funds are limited and may be expended by that priority date.

Once the FAFSA information is received and reviewed by the Financial Aid Office, an Offer of Financial Aid (award letter) and an Award Guide are mailed to the student. Admitted students can view their award letters online at Web for Student, which may be found at www.oit.edu/aid. Students may accept their aid online and request changes. Please log in to Web for Student to do so. The initial award letter is sent in paper form to new students only. Any updates to award letters will result in an e-mail to the OIT student e-mail account. If additional information is requested, such as tax returns, 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 OIT e-mail accounts for announcements and notifications from Financial Aid.

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 VA and Voc Rehab. Individual financial-aid packages will vary based on determined cost of attendance, expected family contributions and outside resources.

Federal Pell Grants
The maximum annual Pell Grant for 2009-10 is $5,350 for full-time students attending three terms. Students may receive Pell Grants as long as they are attending at least half time (6 credits), but the grant will be prorated accordingly. Pell Grant eligibility is limited to those students who have not yet obtained a bachelor’s degree. 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 maximum annual Oregon Opportunity Grant for 2009-10 ranges from $400–$3,200. This grant program provides funds to Oregon resident undergraduate students attending Oregon schools. The Oregon Opportunity Grant has a shared responsibility model. Students not enrolled full time (at least 12 credits) may be eligible for a 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 generally available to those who qualify. A student can receive an Oregon Opportunity Grant for a maximum of 12 terms. More information is available at—www.getcollegefunds.org.

Federal Supplemental Educational Opportunity Grants (SEOG)
SEOG funds are very limited at OIT. Although priority for SEOG funds is given to full-time students, OIT may, on a case-by-case basis, award SEOG funds to students enrolled at least half-time. The typical award is $300 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 Perkins Loan
The Federal Perkins Loan Program has no origination or guarantee fees, a nine-month grace period after a student ceases to be enrolled at least half time before repayment begins and an interest rate of five percent that begins at repayment. Awards at OIT range from $1,000 to $4,000 per year and are based on need. Priority is given to students who are attending full time, but may also be awarded on a case-by-case basis to students attending part time.

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 OIT Web site. Awards are usually $1,500 per year, which can be earned at any time during the academic year provided the student is enrolled at least half time.

Academic Competitive Grant (ACG)
The Academic Competitive Grant (ACG) is a Federal program targeted to Pell Grant-eligible students in their first two academic years. Recipients must meet very specific eligibility criteria related to citizenship, enrollment status, rigor of high school curriculum, high school graduation date, and in the case of second year students, GPA. These grants range from $750 to $1,300 per year.

National Science and Mathematics Access to Retain Talent Grant (SMART)
The National Science and Mathematics Access to Retain Talent Grant (SMART) is a federal grant program targeted to third- and fourth-year Pell Grant-eligible students majoring in mathematics, science, technology, engineering or critical foreign language (as defined by the U.S. Department of Education). In addition to maintaining a 3.0 GPA, recipients must meet very specific eligibility criteria related to citizenship and enrollment status. Grant amounts can be up to $4,000 per year.

Federal Family Education Loan Programs (FFELP)
Federal Stafford Loans (subsidized and unsubsidized) are available to most students. Students can search for lenders on a student loan search engine, located on the Financial Aid Web site at www.oit.edu/aid. While OIT may suggest lenders, students may choose any lender participating in the FFELP Program. Loan amounts vary based on student need and grade level in a declared major at OIT. A guaranteed and origination fee may be taken at the time of disbursement. Contact the OIT Financial Aid Office for most recent interest rates for loans. 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 and during the six-month grace period. 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.

Federal Parent Loans for Undergraduate Students (PLUS)
Parents of dependent students can apply for funds through PLUS. Loans are available for up to the cost of attendance minus other financial aid and resources each year. Interest begins to accrue immediately. Like the student loan, a four percent origination and guarantee fee may be taken at the time of each disbursement, but repayment begins 60 days after the final disbursement of the academic year. A list of suggested lenders and additional information is available online at www.oit.edu/aid. Some lenders will allow interest payments only while the student is in school at least half time.

TEACH Grant
The Teacher Education Assistance for College and Higher Education (TEACH) Grant, of up to $4,000 per year, is available to students who agree to serve as highly qualified teachers in a designated high-need field at a low-income school for four years.
The Klamath County Recognition Scholarship

The Klamath County Recognition Scholarship is automatically awarded to any applicant living in Klamath County who will attend OIT starting the fall term after graduation from high school and who is able to meet two of three criteria: an unweighted high school cumulative GPA of 3.0 or better; top 25 percent rank in class; and/or a composite SAT I score of at least 1,000 (21 ACT). To qualify, students must simply apply for admission, meet all admission requirements and be accepted for admission by Feb. 1 for enrollment fall term. Recipients must be new full-time undergraduate students at OIT. This scholarship is valued at $1,000 and is renewable. It may not be combined with the Dean’s Academic Scholarship.

Oregon Tech Foundation Scholarships

More than 150 new and returning students annually receive scholarships from the more than 100 scholarships administered by the Oregon Tech Foundation. Alumni, businesses, industry, and friends of OIT generously fund these scholarships. To receive consideration, students must be currently enrolled at OIT or accepted for admission for the following fall term, and must submit an application. Application forms and deadlines are available on the OIT 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 application process opens Dec. 1 and has a deadline of Feb. 1. For more information about scholarship opportunities, please visit www.oit.edu/otfscholars.

Leadership and Diversity Scholarships

To be considered for the LAD Scholarship, students must submit the scholarship application (available from the Admissions Office) and the required essay. Students also should provide at least one letter of recommendation from a teacher, counselor, clergy or other appropriate reference. Candidates must be current OIT students or have been accepted for admission for the following fall term and submit all scholarship materials by Feb. 1. Scholarship materials should be directed to the Admissions Office. For more information, call (541) 885-1150.

Oregon Institute of Technology

Budgets for 2009-10

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- Tuition is based on 15 credits, 2009-10 carrying load (based on a 7 to 9 percent increase over 2008-09 figures).
- Fees based on full time enrollment, fees include tech fee, building fee, incidental fee, health service fee each term, and student activity fee.
- Budget is based on $442 per month rent, $340 per month food and $171 per month utilities for on-campus students.
- Miscellaneous expenses include medical supplies, entertainment, personal care products, housekeeping supplies, travel and transportation.
- CLS/Par, RCP and Dental Hygiene/La Grande have a different budget. Please consult the Oregon University System fee book.
- A one-time matriculation fee is assessed first-term students.
- MIT externs have a different budget which includes increased costs for major medical insurance, internet and additional credits.
- A single parent may double the budgeted housing figures with documentation.
- Students enrolled in health professions majors have higher fees. Students may request actual fees to be added to budgets by the Financial Aid Office.
- Budget increase for computer is $1,500 maximum with documentation.
- Please visit www.ous.edu/factreport/tuition for the most current information.
Estimated Financial-Aid Budgets for 2009-10 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

OIT’s Financial Aid Office will process a 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 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.

When OIT 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 OIT’s degree-granting programs and eligible for financial aid.
2. The student must be enrolled at least half-time (6 credits) at OIT.
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 OIT degree.
5. The classes taken at the host institution must not be offered by OIT during the term of enrollment.

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 “forms.” Students must provide OIT’s Financial Aid Office with a final grade report from the “host institution” prior to receiving aid for future terms.

The Guide to Oregon Residence Classification

Residence Classification Policy and Procedures

In Oregon, as in all other states, tuition at publicly supported four-year universities is higher for nonresident 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. Those rules—Oregon Administrative Rules, Chapter 580, Division 10—Board of Higher Education—appear in Notice to Nonresidents of the State of Oregon.

Only duly authorized residency officers have authority to apply and interpret these rules and procedures. No other indication or determination of residency by any other institutional office, department, program, or staff represents the official institutional determination of residency.

Here is a summary of a few key considerations in determining classification as a resident for tuition purposes:

1. Establishment of a domicile and predominant physical presence in Oregon for a period of 12 months or more prior to the beginning of the term for which residency is sought.
2. Financial dependence on an Oregon resident or financial independence.
3. Primary purpose for being in Oregon other than to obtain an education.
5. Various other indicia of residency (e.g., ownership of Oregon living terms, permanent Oregon employment, payment of Oregon income taxes).

To be considered for classification as a resident, certain procedures and materials must be submitted to the institutional residency officer in a complete and timely manner.

1. Obtain and complete the Residence Information Affidavit, which is available from the institutional residency officer.
2. Consult with the residency officer on the provision of all the required supportive documents and materials.
3. Submit the affidavit and all other required materials and documents by the last day to register for the term in which resident status is sought.

Residency Classification Appeals

Any person may appeal an institutional residency classification decision within ten (10) days of the date of mailing or other notification of the decision. The appeal to the OUS Interinstitutional Residency Committee (IRC) must be in writing and filed with the institutional residency officer.

The decision of the IRC may be appealed to the Vice Chancellor for Academic Affairs in writing within ten (10) days of notification of the IRC decision. The decision of the Vice Chancellor is final.

Further Information

Persons interested in further information on or assistance with their OIT residency classification should contact the institutional residency officer, Wendy Pedersen, in the OIT Registrar’s Office at wendy.pedersen@oit.edu.

Determination of Residence

Oregon Administrative Rules
Chapter 580, Division 10
Oregon Board of Higher Education—
These are the residency rules of the Board of Higher Education currently in effect.

580-010-0029
Definitions

For the purpose of OAR 580-010-0030 through 580-010-0045, the following words and phrases mean:

1. Domicile is a person’s true, fixed and permanent home and place of habitation. It is the place where a person intends to remain and to which the person expects to return when the person leaves without intending to establish a new domicile elsewhere. In order to establish a domicile in Oregon, a person must maintain a predominant physical presence in Oregon for 12 consecutive months after moving to the state.
(2) A financially independent person is a person who, at the time of application for residency status:

(a) declares himself or herself to be financially independent;
(b) has not been claimed as a dependent during the immediately preceding tax year, and will not be claimed as a dependent during the current tax year, on the federal or state income tax returns of any other person; and
(c) has not received in the immediately preceding calendar year, and will not receive during the current calendar year, one-half or more of his or her support, in cash or in kind, from another person or persons, except for support received from his or her spouse.

(3) A financially dependent person is a person who, at the time of application for residency status:

(a) declares himself or herself to be financially dependent; and
(b) has been claimed as a dependent on the federal and state income tax returns of another person during the immediately preceding tax year.

580-010-0030
Determination of Residence

(1) For purposes of admission and instruction fee assessment, OUS institutions shall classify a student as Oregon resident or nonresident. In determining resident or nonresident classification, the primary issue is a person's intent in coming to Oregon. Intent is inferred from a person's conduct and history as they relate to the requirements of these residency rules. If a person is in Oregon primarily for the purpose of obtaining an education, that person will be considered a nonresident. It is possible for an individual to qualify as a resident of Oregon for purposes of voting or obtaining an Oregon driver's license and not meet the residency requirements established by these rules.

(2) An Oregon resident is a financially independent person who, prior to the term for which Oregon resident classification is requested, has both:

(a) established and maintained a domicile in Oregon as provided under OAR 580-010-0029(1) for 12 consecutive months; and
(b) during that period, has been primarily engaged in activities other than those of being a college student.

(3) A student may be considered primarily engaged in educational activities regardless of the number of hours for which the student is enrolled. However, a student who is enrolled for more than 8 hours in any semester or term during the 12-month period referred to in section two of this rule shall be presumed to be in Oregon for primarily educational purposes.

Such period of enrollment shall not be counted toward the establishment of a bona fide domicile of 12 consecutive months in this state unless the student proves, in fact, establishment of a bona fide domicile in this state primarily for purposes other than educational.

(4) An Oregon resident is also a financially dependent person who is claimed as a dependent by another person who has both:

(a) established and maintained an Oregon domicile as provided under OAR 580-010-0029(1) for 12 consecutive months; and
(b) during that period, has been primarily engaged in activities other than those of being a college student.

(5) A financially dependent person who is classified as a dependent by another person who has not established and maintained an Oregon domicile shall be presumed to be a non-resident. This presumption may be overcome by evidence of the student's long-standing presence in Oregon and demonstration of other factors under OAR 580-010-0031.

(6) The criteria for determining Oregon resident classification shall also be used to determine whether a person who has moved from Oregon has established a non-Oregon residence.

(7) If institution records show that the residence of a student or the person upon whom the student is dependent is outside of Oregon, the student shall continue to be classified as a nonresident until entitlement to resident classification is shown. The burden of showing that the residence classification should be changed is on the student requesting the change.

(8) Notwithstanding section (4) of this rule, a student who is financially dependent on a non-Oregon resident may nonetheless be considered an Oregon resident if the student resides in Oregon for at least 12 consecutive months with a parent or legal guardian who has both:

(a) established and maintained an Oregon domicile under OAR 580-010-0029(1) for 12 consecutive months; and
(b) during that period, has been primarily engaged in activities other than those of being a college student.

580-010-0031
Residency Consideration Factors

(1) The following factors, although not necessarily conclusive or exclusive, have probative value in support of a claim for Oregon resident classification:

(a) Reside in Oregon for 12 consecutive months prior to the beginning of the term for which resident classification is sought and during that period be primarily engaged in activities other than those of a college student;
(b) Reliance upon Oregon resources for financial support;
(c) Domicile in Oregon of persons legally responsible for the student;
(d) Acceptance of an offer of permanent employment in Oregon; and
(e) Ownership by the person of his or her living quarters in Oregon.

(2) The following factors, standing alone, do not constitute sufficient evidence to effect classification as an Oregon resident:

(a) Voting or registration to vote;
(b) Employment in any position normally filled by a student;
(c) The lease of living quarters;
(d) Admission to a licensed practicing profession in Oregon;
(e) Automobile registration;
(f) Public records, for example, birth and marriage records, Oregon driver's license;
(g) Continuous presence in Oregon during periods when not enrolled in school;
(h) Ownership of property in Oregon or the payment of Oregon income or other Oregon taxes; or
(i) Domicile in Oregon of the student's spouse.

(3) Reliance upon non-Oregon resources for financial support is an inference of residency in another state.

580-010-0033
Evidence of Financial Dependency

(1) In determining whether a student is financially dependent, a student must provide:

(a) Evidence of established domicile as provided under OAR 580-010-0029(1) of the person claiming the student as a dependent; and
(b) The identification of the student as a dependent on the federal and state income tax returns of the person claiming the student as a dependent. Additional documentation to substantiate dependency during the current calendar year may be required at a later time if deemed necessary by the institution.

(2) A student who provides evidence that he or she is a financially dependent person under these rules shall not be required to establish a 12-month domicile prior to classification of resident status, provided such a student may not be classified as a resident while receiving financial assistance from another state or state agency for educational purposes.
580-010-0035

Residence Classification of Armed Forces Personnel

(1) For purposes of this rule, members of the armed forces means officers and enlisted personnel of:

(a) The Army, Navy, Air Force, Marine Corps, and Coast Guard of the United States;
(b) Reserve components of the Army, Navy, Air Force, Marine Corps, and Coast Guard of the United States;
(c) The National Guard of the United States and the Oregon National Guard.

(2) Notwithstanding OAR 580-010-0030, active members of the armed forces and their spouses and dependent children shall be considered residents for purposes of the instructional fee if the members:

(a) Reside in this state while assigned to duty at any base, station, shore establishment, or other facility in this state;
(b) Reside in this state while serving as members of the crew of a ship that has an Oregon port of shore establishment as its home port or permanent station; or
(c) Reside in another state or a foreign country and file Oregon state income taxes no later than 12 months before leaving active duty.

(3) An Oregon resident entering the armed forces retains Oregon residence classification until it is voluntarily relinquished.

(4) An Oregon resident who has been in the armed forces and assigned on duty outside of Oregon, including a person who establishes residency under section (2)(c) of this rule, must, within a reasonable time, demonstrate an intent to retain classification as an Oregon resident. Such intent may be shown by returning to Oregon within six months after completing service in the armed forces.

(5) A person who continues to reside in Oregon after separation from the armed forces may count the time spent in the state while in the armed forces to support a claim for classification as an Oregon resident.

(6) The dependent child and spouse of a person who is a resident under section (2) of this rule shall be considered an Oregon resident. “Dependent child” includes any child of a member of the armed forces who:

(a) Is under 18 years of age and not married, otherwise emancipated or self-supporting; or
(b) Is under 23 years of age, unmarried, enrolled in a full-time course of study in an institution of higher learning, and dependent on the member for over one-half of his/her support.

580-010-0037

Residence Classification of Members of Oregon Tribes

(1) Students who are enrolled members of federally recognized tribes of Oregon or who are enrolled members of a Native American tribe which had traditional and customary tribal boundaries that included parts of the state of Oregon or which had ceded or reserved lands within the state of Oregon shall be assessed resident tuition regardless of their state of residence.

(2) For purposes of this rule, the federally recognized tribes of Oregon are:

(a) Burns Paiute Tribe;
(b) Confederated Tribes of Coos, Lower Umpqua and Siuslaw;
(c) Confederated Tribes of Grand Ronde Community of Oregon;
(d) Confederated Tribes of Siletz Indians of Oregon;
(e) Confederated Tribes of the Umatilla Indian Reservation;
(f) Confederated Tribes of the Warm Springs Indian Reservation;
(g) Coquille Indian Tribe;
(h) Cow Creek Band of Umpqua Indians;
(i) Klamath Tribes.

(3) For purposes of this rule, the Native American tribes that had traditional and customary tribal boundaries that included parts of the state of Oregon or which had ceded or reserved lands within the state of Oregon are:

(a) CALIFORNIA:
  (A) Benton Paiute Tribe;
  (B) Big Bend Rancheria;
  (C) Big Lagoon Rancheria;
  (D) Blue Lake Rancheria;
  (E) Bridgeport Indian Colony;
  (F) Cedarville Rancheria;
  (G) Fort Bidwell Indian Tribe;
  (H) Hoopa Valley Tribe;
  (I) Karuk Tribe of California;
  (J) Likely Rancheria;
  (K) Lookout Rancheria;
  (L) Lytton Rancheria;
  (M) Melochnund Band of Tolowa Indians;
  (N) Montgomery Creek Rancheria;
  (O) Pit River Tribe;
  (P) Quartz Valley Indian Community;
  (Q) Redding Rancheria;
  (R) Roaring Creek Rancheria;
  (S) Smith River Rancheria;
  (T) Susanville Rancheria;
  (U) Tolowa-Tututni Tribe;
  (V) Winnemucca Colony;
  (W) XL Ranch;
  (X) Yurok Tribe.

(b) IDAHO:
  (A) Nez Perce Tribe of Idaho;
  (B) Shoshoni-Bannock Tribes.

(c) NEVADA:
  (A) Duck Valley Shoshone-Paiute Tribes;
  (B) Fallon Paiute-Shoshone Tribe;
  (C) Fort McDermitt Paiute-Shoshone Tribe;
  (D) Lovelock Paiute Tribe;
  (E) Pyramid Lake Paiute Tribe;
  (F) Reno-Sparks Indian Colony;
  (G) Summit Lake Paiute Tribe;
  (H) Walker River Paiute Tribe;
  (I) Winnemucca Indian Colony;
  (J) Yerington Paiute Tribe.

(d) OKLAHOMA:
  Modoc Tribe of Oklahoma.

(e) WASHINGTON:
  (A) Chehalis Community Council;
  (B) Colville Confederated Tribes;
  (C) Quinault Indian Nation;
  (D) Shoalwater Bay Tribe;
  (E) Yakama Indian Nation.

(4) A student seeking to be assessed resident tuition under the provisions of this rule shall submit, following procedures prescribed by the OSU institution where the student seeks to enroll, a photocopy of tribal enrollment which documents tribal membership.

580-010-0040

Residence Classification of Non-Citizens

A person who is not a citizen of the United States may be considered an Oregon resident if the person qualifies as a resident under OAR 580-010-0030 and is one of the following:

(1) A lawful permanent resident. The date of approval of lawful permanent residency shall be the earliest date upon which the 12-month residency requirements under OAR 580-010-0030 may begin to accrue.

(2) An immigrant granted refugee or political asylum in the United States. The date of approval of political asylum or refugee status shall be the earliest date upon which the 12-month residency requirements under OAR 580-010-0030 may begin to accrue.

(3) A person holding one of the following non-immigrant visa classifications: A, E, G, H-1B, H-1C, the spouse or child of a person holding an H-1B or H-1C visa, I, K, L, NATO, O, R, S, T, TN, U, or V. The date of the issuance of a visa for one of these classifications shall be the earliest date upon which the 12-month residency requirements under OAR 580-010-0030 may begin to accrue. A person possessing a non-immigrant or temporary visa that is not identified under this rule shall not be considered an Oregon resident.
580-010-0041
Changes in Residence Classification

(1) If an Oregon resident student enrolls in an institution outside of Oregon and later seeks to re-enroll in an OUS institution, the residence classification of that student shall be re-examined and determined on the same basis as for any other person.

(2) A financially dependent student who is dependent on a person who establishes a permanent Oregon residence as defined in OAR 580-010-0030(2) during a term when the dependent student is enrolled at an OUS institution may register as a resident at the beginning of the next term.

(3) Once established, classification as a resident continues so long as the student remains in continuous academic year enrollment in the classifying institution.

(4) A person who seeks classification as a resident under these rules shall complete and submit a notarized Residence Information Affidavit. The affidavit and all required supportive documents and materials must be submitted by the last day to register for the term in which resident status is sought.

(5) No OUS institution is bound by any determination of residency except by duly authorized officials under procedures prescribed by these rules including timely submittal of the notarized affidavit.

580-010-0045
Review of Residence Classification Decisions by IRC

(1) An interinstitutional residency committee (IRC) is established consisting of the officers determining student residence classification at OUS institutions and a member of the Chancellor’s staff appointed by the Chancellor. The member of the Chancellor’s staff shall serve as chairperson. A majority of the members of the Committee shall constitute a quorum. A majority of a quorum may make decisions.

(2) Residence cases of unusual complexity, especially where there may be conflict of rules, may be referred by an institution residence classification officer to the IRC for decision.

(3) Any person who is aggrieved by the institution residence classification may, within 10 days of the date of mailing or other service of classification decision, appeal the classification to the IRC. The appeal must be in writing and shall be filed with the institution. An aggrieved person may supply written statements to the IRC for consideration in reviewing the case and may also make an oral presentation to the IRC on a date to be scheduled by the IRC. The decision of the IRC shall be final unless appealed.

(4) A person dissatisfied with the IRC decision may, within ten days of the date of the mailing or other service of the IRC decision, appeal the IRC decision to the Vice Chancellor for Academic Affairs or designee. An appeal to the vice chancellor shall be in writing only. The vice chancellor’s decision shall be final.

(5) A person granted a meritorious hardship exception to residency under this rule prior to July 1, 1990, shall not lose the exception solely because of the repeal of the exception authorization.

580-010-0047
Residents Under WICHE

A certification officer, designated by the Board, shall determine the residence classification of any person seeking certification as an Oregon resident, pursuant to the terms of the WICHE Compact. Any person dissatisfied with the decision of the certification officer may appeal to the IRC. The decision of the IRC shall be final unless further appeal is made to the Vice Chancellor for Academic Affairs pursuant to OAR 580-010-0045(4).

Western Undergraduate Exchange

The Western Undergraduate Exchange (WUE) program offers a substantial tuition break to most new OIT students from Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, North Dakota, South Dakota, Utah, Washington and Wyoming. Students who qualify for the WUE program pay OIT tuition at just 150 percent of the in-state tuition rate, resulting in tuition savings in excess of $7,000 per year.

Recipients must take a minimum of 12 credits per term at OIT, exclusive of concurrently enrolled classes at a community college. WUE awarded to freshmen is renewable (up to a total of 12 terms), as long as the recipient continues to make Satisfactory Academic Progress. Transfer students’ eligibility may be prorated. WUE is awarded only upon enrollment as a new student and is not awarded to continuing students who did not receive it when they first started at OIT. WUE recipients may not be eligible for some scholarships (check with OIT Admissions).

Tuition and Fees

Jan Lewis, Director of Business Affairs
Snell Hall, 201
(541) 885-1235
jan.lewis@oit.edu

Fees and deposits in all Oregon state institutions of higher education are charged according to a uniform plan, varying on different campuses according to differences in conditions or nature of coursework offered. The State Board of Higher Education reserves the right to make changes in fee schedules without notice.
Below are listed the estimated fees paid by students regularly enrolled for undergraduate and graduate study. Payment of full-time fees entitles students to use the library, ride the local Basin Transit Service buses, laboratory equipment and materials in courses in which they are registered. Students may receive medical attention from the Student Health Center, use the fitness center (Tech Fit Center) 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 2009-10 academic years is provided for planning purposes only. Fees are subject to change. The current fee schedule is available from the Business Office, Registrar’s Office or on the university’s Web site.

Special Fees

All special fees are subject to change without notice.

Application Fee (Not refundable)–$50
Must accompany admission application.

Matriculation Fee–$150
A one-time fee assessed to all new and transfer students.

Petition to Graduate Fee–$50

Late Fee Payment, first day payment is late–$15
Full-time students paying fees after scheduled payment dates of any term pay a late charge of $15 for the first day and $2 per day thereafter. Maximum late fee is $99.

Late Fee to Add, Drop or Withdraw–$20

Return-of-Check Fee–$20
If institutional charges are met by a check which is returned because of any irregularity for which the student is responsible, a fine will be charged. The late-registration fee will be added to the returned-check charge where the returned check was used to pay tuition and fees.

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

Transcripts
One-time fee assessed during first term of attendance—$40
Official Transcripts are issued at no charge.

Special Mailing Fee—Actual cost of mailing.

Differential Tuition in Health Programs
Additional 15% tuition for courses unique to Health Professions.

Special Course Fees, per course
Special fees, in addition to regular tuition, are assigned for some courses. These fees are noted in the Schedule of Classes for each term.

Room and Board Costs
The 2009-10 estimated annual room-and-board costs range from $7,495 to $9,695, depending on room type and amount of food purchased. Room-and-board charges are assessed by the term. Fees are due in accordance with the same fee payment schedule as exists for tuition. Generally, payments are due during the first week of the term.

Senior Citizen Instruction Fee
Per-credit hour: no charge.

Senior citizens are persons age 65 or older. Such persons are authorized to attend classes on a space-available basis. Charges for special materials, if any, are additional. Incidental fee privileges are not provided.

The senior-citizen privilege is extended to persons auditing classes (not seeking credit or working toward a degree).

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. Periodicals—Magazines and newspapers have a $1-per-day charge for each over-
due item up to the maximum overdue fine.

3. Reserved books—The following fines will be charged for violation of rules governing reserve books and other restricted materials: For overdue items, 25 cents for the first hour and 25 cents for each succeeding hour, or portion thereof, until the material is returned or reported lost. In case of flagrant rule violation, a charge of $1 per hour may be assessed, but in no case will a fine of more than $10 be assessed.

4. Recalls—Materials needed for use in the library are subject to recall at any time. A maximum fine of $1 per day may be imposed for failure to return promptly.

5. 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.

6. 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.

See following pages for 2009-10 proposed fee schedules.
## Oregon Institute of Technology

### 2009-10 Academic Year Tuition and Required Fees

**Undergraduate—Per Term**

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Each Add'l Credit Hour

116.00  

- Classes in health program curriculums are assessed at differential tuition rates: $133 per credit hour; $426 for non-residents at 9+ credit hours.
- Up to a $100 per term resource fee is assessed to students in the Health and Engineering Programs.
- OIT East and West Portland students are assessed a $15 per term incidental fee.
- Full Incidental Fees and Health Service Fees are optional to OIT Portland students through Portland State University at PSU rate.
- Health Services is optional for 1-5 credits; if option is exercised, fee is $106 per term.
- $38 of Health Service Fee is for Basic Health Insurance for students with 6 or more credit hours.
- Dental students will be assessed a $3 needlestick in addition to the Health Service Fee.
- Students in upper division health curriculums are required to carry major medical insurance.
- A one-time $150 Matriculation Fee and a $40 Transcript For Life Fee is assessed on all new and transfer students.
- Qualified tuition and fees do not include Health Service Fee or student insurance fees for Tax Relief Act reporting.
- Please visit www.ous.edu/factreport/tuition for the most current information.
Oregon Institute of Technology
2009-10 Academic Year Tuition and Required Fees
Graduate—Per Term

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Each Add’t Credit Hour

- Classes in health program curriculums are assessed at differential tuition rates: $133 per credit hour; $426 for non-residents at 9+ credit hours.
- Up to a $100 per term resource fee is assessed to students in the Health and Engineering Programs.
- OIT East and West Portland students are assessed a $15 per term incidental fee.
- Full Incidental Fees are optional to OIT Portland students through Portland State University.
- Health Services is optional for 1-5 credits; if option is exercised, fee is $106 per term.
- $38 of Health Service Fee is for Basic Health Insurance for students with 6 or more credit hours.
- Students in upper division health curriculums are required to carry major medical insurance.
- A one-time $150 Matriculation Fee and a $40 Transcript For Life Fee is assessed on all new and transfer students.
- Qualified tuition and fees do not include Health Service Fee or student insurance fees for Tax Relief Act reporting.
- Please visit www.ous.edu/factreport/tuition for the most current information.
### Oregon Institute of Technology

#### Paramedic Education Program

**2009-10 Academic Year Tuition and Required Fees—Per Term**

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**Each Add’l Credit Hour**

- One-time fees assessed to all new and transfer students: $40 Transcript for Life Fee.
- Students are required to carry major medical insurance or a policy approved by OIT.
- The major medical insurance requirement may be satisfied if the student shows satisfactory proof of equivalent insurance and signs a statement agreeing to keep it in force during the academic period for which the fees are being paid.
- Major Medical includes $38.00 for basic health insurance.
- Facilities Use & Health Service fees are set by OHSU and are subject to change.
- Externs in this program do not pay the Facilities Use Fee.
- Students in this program do not pay the Health Professions Resource Fee.
- Qualified tuition and fees do not include student health fees and insurance fees for Tax Relief Act reporting.
- Please visit [www.ous.edu/factreport/tuition](http://www.ous.edu/factreport/tuition) for the most current information.
## Oregon Institute of Technology

### Clinical Laboratory Science Program

#### 2009-10 Academic Year Tuition and Required Fees—Per Term

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<th>Credit Hours</th>
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### Each Add'l Credit Hour

- 185.00
- 325.00

- One-time fees assessed to all new and transfer students: $40 Transcript for Life Fee.
- Students are required to carry major medical insurance or a policy approved by OIT.
- The major medical insurance requirement may be satisfied if the student shows satisfactory proof of equivalent insurance and signs a statement agreeing to keep it in force during the academic period for which the fees are being paid.
- Major Medical includes $38.00 for basic health insurance.
- Facilities Use, Incidental & Health Service fees are set by OHSU and are subject to change.
- Students in this program do not pay the Health Professions Resource Fee.
- Qualified tuition and fees do not include student health fees and insurance fees for Tax Relief Act reporting.
- Please visit [www.ous.edu/factreport/tuition](http://www.ous.edu/factreport/tuition) for the most current information.
## Oregon Institute of Technology
### Dental Hygiene Program—LaGrande
#### 2009-10 Academic Year Tuition and Required Fees—Per Term

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<tr>
<th>Credit Hours</th>
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</table>

- The Dental Hygiene Program in LaGrande operates on a contractual agreement between ODS, EOU, and OIT.
- Incidental and Health Service Fees are set at EOU rates as approved by the Board and are subject to change.
- Health Service fee includes basic health insurance.
- Qualified tuition and fees do not include student health services or student insurance fees for Tax Relief Act reporting.
- Students enrolled in the Dental Hygiene Program in LaGrande are required to purchase a student instrument kit, books, scrubs, and a computer use fee from ODS.
- Students in this program do not pay the Health Professions Resource Fee.
- Please visit www.ous.edu/factreport/tuition for the most current information.
**Klamath Falls**

**Master of Science**
- Civil Engineering
- Manufacturing Engineering Technology

**Bachelor of Science**
- Allied Health Management
- Applied Mathematics
- Applied Psychology
- Biology
- Civil Engineering
- Communication Studies
- Computer Engineering Technology
- Dental Hygiene
- Diagnostic Medical Sonography
- Echocardiography
- Electrical Engineering
- Embedded Systems Engineering Technology
- Environmental Sciences
- Geomatics, with options in:
  - Geographic Information Systems
  - Surveying
- Health Sciences
- Information Technology, with options in:
  - Accounting
  - Applications Development
  - Business/Systems Analysis
  - Health Informatics
- Management, with options in:
  - Accounting
  - Entrepreneurship/Small Business Management
  - Marketing
- Manufacturing Engineering Technology
- Mechanical Engineering
- Mechanical Engineering Technology
- Nuclear Medicine Technology
- Nursing (through OHSU School of Nursing)
- Operations Management
- Radiologic Science
- Renewable Energy Engineering
- Respiratory Care
- Software Engineering Technology
- Vascular Technology

**Associate Degrees**
- Associate of Applied Science
  - Polysomnographic Technology
- Associate of Engineering
  - Computer Engineering Technology
  - Software Engineering Technology

**Minors**
- Applied Mathematics
- Biology
- Business
- Geographic Information Systems
- Human Communication
- Information Technology
- International Business
- International Relations
- Psychology
- Technical Communication

**Specializations**
- Accounting
- Entrepreneurship/Small Business Management
- Marketing
- Picture Archiving and Communication Systems (PACS)

**Certificates**
- Accounting (post baccalaureate)
- Dispute Resolution
- Polysomnographic Technology

**Portland**

**Master of Science**
- Manufacturing Engineering Technology

**Bachelor of Science (degree completion)**
- Clinical Laboratory Science (joint degree with OHSU)
- Electronics Engineering Technology
- Information Technology, with options in:
  - Applications Development
  - Business/Systems Analysis
  - Health Informatics
- Manufacturing Engineering Technology
- Mechanical Engineering Technology
- Operations Management
- Renewable Energy Engineering
- Software Engineering Technology

**Associate of Applied Science**
- Emergency Medical Technology–Paramedic (joint degree with OHSU)

**Boeing Company, Seattle, Washington**

**Master of Science**
- Manufacturing Engineering Technology

**Bachelor of Science (degree completion)**
- Manufacturing Engineering Technology
- Mechanical Engineering Technology

**La Grande (ODS College of Dental Sciences)**

**Associate of Applied Science**
- Dental Hygiene
Introduction

For more than 60 years, Oregon Institute of Technology has focused on changing the lives of Oregonians by preparing them to meet the technical and management needs of business, industry and healthcare agencies.

Today, OIT offers a menu of academic choices that features bachelor of science programs in engineering, the engineering and health technologies, management, communication and the applied sciences. These include bachelor’s degree-completion programs offered online and at locations in Portland and Seattle, Wash. OIT also offers a number of associate degree programs.

OIT 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.

Degree Programs

Graduate Programs
A Master of Science in Manufacturing Engineering Technology is offered at OIT campuses in Portland, Klamath Falls and at The Boeing Company in Washington.

A Master of Science in Civil Engineering is offered at OIT’s Klamath Falls campus.

Undergraduate Programs
The School of Health, Arts and Sciences includes Allied Health Management, Clinical Laboratory Science, Dental Hygiene, Health Sciences, Medical Imaging Technology, Applied Psychology, Environmental Sciences, Communication Studies, Paramedic Education, Respiratory Care and Polysomnographic Technology. Nursing is offered as part of a statewide program administered by the Oregon Health & Science University. Programs in Clinical Laboratory Science and Paramedic Education are offered in Portland in conjunction with OHSU. A Bachelor of Science in Respiratory Care is offered on the Klamath Falls campus and online. In Dental Hygiene, the bachelor’s degree is offered in Klamath Falls and the associate degree in La Grande at ODS College of Dental Sciences. An online degree completion bachelor’s is also offered.

Medical Imaging, one of the largest bachelor’s degree programs in the nation in this field, includes majors in Radiologic Science, Vascular Technology, Diagnostic Medical Sonography, Nuclear Medicine Technology and Echocardiography.

The faculty in the School of Health, Arts and Sciences includes individuals with nationally-recognized credentials and international experience. Clinical practice and externships are included in health technology education, while the arts and sciences provide exposure to liberal studies that complement technical coursework.


The School’s faculty is composed of professional engineers, certified public accountants and those with corporate executive experience. From accounting to robotics, these programs include extensive laboratory time to apply the theories that are studied.

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 preregister 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 distance education.

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. Registration for summer term begins May 1.
Portland Programs

Lita Colligan, Associate Vice President for Strategic Partnerships

Dick Swanson, Director of Facilities and Contracts

Professor: Lawrence Wolf, Manufacturing and Mechanical Engineering and Technology

Associate Professor: Mateo Aboy, Electrical Engineering and Renewable Energy

Assistant Professor: Robert Bass, Electrical Engineering and Renewable Energy

Associate Professor: Jay Bockelman, Computer Systems Engineering Technology

Associate Professor: Grant Kirby, Management

Assistant Professor: Michael Kirshner, Management

Assistant Professor: Geoffrey Peter, Manufacturing and Mechanical Engineering and Technology

Assistant Professor: Thomas White, Electrical Engineering and Renewable Energy

Assistant Professor: Cristina Crespo-Veiga, Electrical Engineering and Renewable Energy

OIT Portland Web site: www.oit.edu/portland

OIT offers degree programs at four locations in the Portland area: the OIT Portland East Campus in Clackamas and the OIT Portland West Campus in Beaverton, as well as two joint programs with Oregon Health & Science University in the Portland region. These programs are primarily designed for working professionals who are motivated to advance in their careers. Most courses are offered on an extended-day and weekend schedule.

All OIT Portland degree programs are taught by OIT faculty and industry-experienced adjuncts in a curriculum that directly parallels the courses offered in Klamath Falls. An OIT Portland degree blends theory and real-world practice in well-equipped laboratories and project-based courses.

At OIT Portland, students can:

- Transfer up to 120 applicable credits from a community college, or other accredited college, depending on courses taken and degree desired.
- Earn up to 45 credits of “Credit for Prior Learning” through:
  - a. Credit by Examination: Challenge courses where you have working knowledge of the subject.
  - b. Credit by Portfolio: Demonstrate mastery of course outcomes through documentation.
  - c. Military course credit through accredited evaluation.
- Enjoy small student-to-faculty ratio in the classroom.
- Expect industry-experienced faculty to teach classes, not a teaching assistant.
- Pay significantly lower public tuition rates and receive full student assistance services.
- Expect to become highly desirable employees.

The Portland degree-completion programs are included under the institutional accreditation by the Northwest Commission on Colleges and Universities, the same agency that accredits all Oregon University System (OUS) institutions. All OIT engineering technology programs are accredited by ABET, the Accreditation Board for Engineering and Technology.

OIT Portland offers eight bachelor of science degree completion programs and one master of science program to students in the Portland Metropolitan area. OIT’s programs include both bachelor of science degree and professional-development programs in Electronics Engineering Technology, Operations Management, Information Technology, Manufacturing Engineering Technology, Mechanical Engineering Technology, Renewable Energy Engineering and Software Engineering Technology. All four years of the technical courses are available for Renewable Energy Engineering and Software Engineering Technology. OIT Portland’s Information Technology Program has three specializations: Systems Analysis, Applications Development and Health Informatics and classes are offered in a traditional classroom or online.

Additionally, OIT offers a bachelor’s degree in Clinical Laboratory Science and an Associate degree in Emergency Medical Services (Paramedic) in Portland in collaboration with Oregon Health and Science University. Classes are conducted on the Oregon Health & Science University campus and at the Tualatin Valley Fire and Rescue Training Center in Sherwood. Administrative details are facilitated by the Klamath Falls Campus.

OIT also provides upper division general education courses that complement a foundation of general education courses offered by community colleges and other educational institutions. Generally, students must complete lower division writing, communication and math courses at another institution in order to complete a bachelor’s degree at OIT Portland.

All baccalaureate programs are offered in cooperation with other OUS institutions and area community colleges, which provide lower-division general education courses. Classes are held at the two OIT campuses, other OUS campuses, at various community colleges and selected industrial facilities in the Portland area.
A schedule of degree-related courses for OIT Portland is published about six weeks prior to each term. Printed copies can be obtained through the OIT Portland administrative office, (503) 821-1250, or accessed at: www.oit.edu/portland.

**Educational Partnerships**

OIT has developed educational partnerships to make it as easy as possible for students to transfer credits, complete their degrees and move up the career ladder. OIT has dual enrollment agreements with Portland Community College, Clackamas Community College, Chemeketa Community College and Mt. Hood Community College. Students may begin a bachelor’s degree program at a partner community college and complete a bachelor’s degree at OIT. Under these agreements, the student’s college transcript is automatically sent to OIT at the end of each term of enrollment. An advantage of dual enrollment is that students only need to complete one application form in order to be admitted at both institutions. The completion of a dual enrollment form allows students to authorize OIT and the community college to freely share academic information with each other, which streamlines transcript requests and transfer evaluations. For information about dual enrollment, go to www.oit.edu/portland/admission.

OIT also has articulation agreements with many community colleges that allow students to have a clear understanding of what courses will transfer to OIT and satisfy requirements for the major. Articulation agreements help students who have completed courses at community colleges or other institutions to map a career path.

Articulation Agreements and Advising Guides for each Portland-based degree program are listed on the OIT Web site: www.oit.edu/registrar/articulations.

**Business Partnerships**

OIT Portland’s faculty work closely with business partners and advisers to ensure that their courses integrate new technologies and are responsive to business needs for skilled professionals. Portland area businesses, such as Intel, Maxim, PCC Structurals, and Oregon Cutting Systems, regularly send their best and brightest to OIT for degree completion so they can advance into engineering, technology or management positions within their organizations.

In addition, selected courses may be packaged into modules to address specific skill development needs and may be offered at times and locations that are convenient for the business customer. These short courses or workshops are available through contract and customized training in response to requests by the industrial community.


Individual businesses or clusters of companies that are interested in developing a customized short course or professional development program are encouraged to call OIT Portland administrative office, (503) 821-1250 or the Associate Vice President for Strategic Partnerships at (503) 821-1247.

---

**The Boeing Company Program, Seattle, Washington**

David Woodall, *Director*
(425) 237-3846 office
(425) 965-1514 fax
david.woodall@oit.edu

A. Diane Tiefel, *Assistant Director*
(425) 965-9707 office
(425) 965-1514 fax
diane.tiefel@boeing.com
www.oit.edu/boeing

*Associate Professor: N. Mead*

**U.S. Postal Service Mailing Address:**
A. Diane Tiefel,  OIT-Boeing Program Office
The Boeing Company
PO Box 3707, MC 60-AM
Seattle, WA 98124

**Shipping Address:**
A. Diane Tiefel,  OIT-Boeing Program Office
The Boeing Company
800 North 6th Street, MC 60-AM
Renton, WA 98055

OIT offers Bachelor and Master of Science Degrees in Manufacturing Engineering Technology and a Bachelor of Science Degree in Mechanical Engineering Technology to employees of The Boeing Company at sites in the Puget Sound area. Also offered are review classes for the Society of Manufacturing Engineers’ CMfgT and CMfgE exams and a Certificate of Completion in Composites.
Distance Education
Barb DeKalb, Director
Semon Hall, 223
(541) 885-1142
tara.garlock@oit.edu

The primary mission of Distance Education at OIT is to offer convenient programs for degree completion. Working adults, particularly those registered or licensed in an array of health professions, may easily utilize these Web-based offerings. Currently, OIT offers programs in Echocardiography, Dental Hygiene, Radiologic Science, Vascular Technology and Respiratory Care. Typically, students in these programs will start distance education from a foundation for degree completion built on two sources:
1. Credit completed at another school and will transfer to OIT; and
2. Substantial credit granted for past experience and/or registry or licensure in their profession.

Oregon Institute of Technology also offers a distance program leading to Bachelor of Science degrees in Information Technology and Operations Management. Although most of the coursework for these majors may be completed through online delivery, a handful of courses may require students to complete on-site laboratory work in Portland or Klamath Falls. Students from outside the area may complete these requirements by transferring approved courses from another college or university.

OIT also offers a certificate program and an Associate of Applied Science degree in Polysomnographic Technology.

Additionally, Distance Education offers online courses leading to a minor in Information Technology, which can be completed in conjunction with a degree program at OIT or Eastern Oregon University; certification in Picture Archiving Communication Systems (PACS); and a bank of online general education courses open to all OIT students.

Distance education classes typically run about 10 weeks in length and are paced to keep students on track, while allowing them to complete weekly assignments at their convenience.

Pre-College Programs
Vacant, Director
Pre-College Programs
(541) 885-1815

Jennifer Wheeler, Coordinator, High School Transitions, Pre-College Programs
(541) 885-1278

Tara Garlock, Coordinator K-8 Elementary and Junior High Transitions, Pre-College Programs
(541) 885-1668

Alicia Jones, Office Manager
(541) 885-1815

OIT's Pre-College Programs Office offers innovative and energizing 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; and
3. Introduce them to role models and mentors.

Advanced Credit Program—The Advanced Credit Program (ACP) 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 OIT. ACP gives students the opportunity to try college-level courses, gain valuable skills, and develop study habits for college.

Expanding Your World—a two-day conference on OIT’s campus for eighth-grade boys and girls. The goal of this event is to increase awareness of science and technology, engineering and mathematics careers; to increase students’ knowledge of occupations that are non-traditional to their gender; and to provide boys and girls with opportunities to meet and interact with positive role models from the community.

FIRST LEGO League (FLL)— FLL is geared towards fourth- through ninth-grade students introducing them to the interesting world of LEGO robotics. Teams of four to ten students build, program and complete missions with the robot they’ve built. A presentation and technical performance for judges is also required. Students compete in December at OIT and winners advance to the State competition held in Portland in January.

GEAR UP— A series of special programs, created in partnership with Oregon GEAR UP, to ensure that Oregon’s low-income middle school and high school students are prepared for, pursue and succeed in post-secondary education. These programs include My Story: Finding the Hero Within; GRAD: Graduation Really Achieves Dreams; and A Hero’s Journey: Countdown to College.

High School Transition Program— This is a special offering to high school students to take some of their first-year required courses while still in high school. The students come to the OIT campus to take regular OIT classes, receiving OIT credit at a reduced cost.

I’m Going to College— In partnership with NELA, this day program brings sixth-grade students to campus to expose them to college. The students attend classes, tour OIT and have lunch. A follow-up meeting with parents will be hosted by students’ elementary schools.

MATHCOUNTS— An annual competition in February that challenges students’ math skills, develops their self-confidence and rewards them for their achievements.
Open to sixth-, seventh- and eighth-grade students in the Klamath Basin, this program gives students the opportunity to participate in individual and team competitions. The top students advance to the state and national levels.

**Teen Women in Science (TWIST)** — This residential weeklong summer program focuses on high school women. The program integrates principles of math, computer applications, and engineering. Students experience campus life and gain exposure to career choices in science and engineering. OIT celebrates 18 years of bringing TWIST to young women.

Summer programs include: Amazing Games, DayDreamer, and LEGO Day Camp. For information on these programs, please visit www.oit.edu/precollege.
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 OIT’s Web site and distributed to new students during their first registration at OIT. Students are encouraged to meet regularly with their departmental advisers and to contact the Registrar’s Office with questions about academic procedures, policies or regulations.

Academic Advising
Students are assigned faculty advisers from their academic programs. Advisers maintain a file on students’ progress and help them plan course loads. If a student should change programs, a new adviser will be assigned. The student’s advising file will be transferred to and maintained by the new adviser. Degree-seeking students are required to meet with their advisers prior to registration.

Student Classification
In the Oregon University System 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.

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 OIT and have an OIT 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.

**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 reenroll, 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 reenrollment information. Students who have been suspended are denied all privileges of the institution.

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

**Advanced Standing**

**Credit for Prior Learning**

Credit for prior learning by a student admitted to OIT may be granted through a number of independent processes. These include: A) Transfer Credit; B) Military Credit; C) College Level Examination Programs (CLEP) and Advanced Placement Credit (AP); D) Credit for National Registry or Licensure Exams; E) Credit by Examination; and F) 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**

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

**Accreditation Status of Institution**

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

Students transferring work from an institution that is not 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 OIT with a credential evaluation from an OIT-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.

**Determination of Transfer Credit**

The OIT Registrar’s Office 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 OIT. Articulation agreements give students a clear understanding of what courses will transfer to OIT 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 adviser 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 OIT major or by transfer institution. Questions regarding these agreements may be directed to the students’ academic department or the OIT Registrar’s Office.

**Applicability of Transfer Credit**

OIT provides a complete, written transfer evaluation 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, OIT’s written transfer evaluation 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 OIT courses, may be appropriately substituted to meet OIT
requirements. Students may seek course substitution approval by completing the Course Waiver/Substitution form and obtaining the signature of the adviser, department chair and Registrar.

C. College-Level Examination Programs and Advanced Placement:

College Level Examination Program (CLEP)

OIT 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 Registrars Office from the testing service. In order to receive such credit, the student must be admitted to an OIT degree program and registered for classes during the term in which the request is made. OIT 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 OIT 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 OIT transcript. AP course equivalences are listed above or may be obtained from the Office of Admissions or Registrar’s Office. The equivalencies are currently being reviewed and may change.

A maximum of 25 percent of the credits used toward the degree may be CLEP and AP.

International Baccalaureate

OIT 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. OIT may award credit to students who receive a 5 or higher on any Higher Level IB examination. No credit is awarded for Subsidiary Level exams. For more information, please contact the Registrar’s Office at (541) 885-1300.

D. Credit for National Registry or Licensure Exams

OIT 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 in the Office of Distance Education, which coordinates on-line degree completion programs offered by OIT.

Credit by Examination and Credit for Prior Experiential Learning

OIT awards credit for educational accomplishments attained outside of accredited postsecondary institutions.

E. Credit by Examination

Students currently enrolled at OIT 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 record.
3. No more than 25 percent of the credits submitted for graduation may be credit by examination.
4. Credit by examination counts toward graduation residency requirements. For a bachelor’s degree, students must complete 45 credits at OIT with the last 15 to be taken on campus. For the associate degree, students must complete 30 credits with the last 15 to be taken on campus.
5. 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 Registrar records “P” grades on the student transcript, but does not count the P in grade-point-average calculations. The Registrar does not record “F” grades.
6. Students must pay a non-refundable per-credit fee, as published by the Office of Business Affairs, prior to the examination.
7. 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. OIT may grant credit for experiential learning when it is judged to be equivalent to college-level courses in the OIT 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
OIT 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 OIT. 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 OIT and the university reserves the right to declare any course offering as inappropriate for prior experiential learning credit.

<table>
<thead>
<tr>
<th>EXAM</th>
<th>SCORE</th>
<th>CREDIT</th>
<th>COURSE</th>
</tr>
</thead>
<tbody>
<tr>
<td>English Language and Composition</td>
<td>3+</td>
<td>3</td>
<td>WRI 121</td>
</tr>
<tr>
<td>English Literature and Composition</td>
<td>3+</td>
<td>3</td>
<td>Humanities elective</td>
</tr>
<tr>
<td>Environmental Science</td>
<td>3+</td>
<td>4</td>
<td>BIO 111 or ENV elective</td>
</tr>
<tr>
<td>French Language</td>
<td>3+</td>
<td>12</td>
<td>Humanities elective</td>
</tr>
<tr>
<td>French Literature</td>
<td>3+</td>
<td>4</td>
<td>Humanities elective</td>
</tr>
<tr>
<td>German Language</td>
<td>3+</td>
<td>12</td>
<td>Humanities elective</td>
</tr>
<tr>
<td>Latin Vergil</td>
<td>3+</td>
<td>12</td>
<td>Humanities elective</td>
</tr>
<tr>
<td>Latin Literature</td>
<td>3+</td>
<td>4</td>
<td>Humanities elective</td>
</tr>
<tr>
<td>Spanish Language</td>
<td>3+</td>
<td>12</td>
<td>Humanities elective</td>
</tr>
<tr>
<td>Spanish Literature</td>
<td>3+</td>
<td>4</td>
<td>Humanities elective</td>
</tr>
<tr>
<td>Government—Comparative</td>
<td>4+</td>
<td>3</td>
<td>Humanities elective</td>
</tr>
<tr>
<td>Government—U.S.</td>
<td>4+</td>
<td>3</td>
<td>PSCI 201</td>
</tr>
<tr>
<td>History—European</td>
<td>3+</td>
<td>6</td>
<td>Social Science elective</td>
</tr>
<tr>
<td>History—U.S.</td>
<td>3+</td>
<td>6</td>
<td>HIST 201, HIST 202</td>
</tr>
<tr>
<td>Human Geography</td>
<td>3+</td>
<td>4</td>
<td>Social Science elective</td>
</tr>
<tr>
<td>Macro Economics</td>
<td>3+</td>
<td>3</td>
<td>ECO 202N</td>
</tr>
<tr>
<td>Micro Economics</td>
<td>3+</td>
<td>3</td>
<td>ECO 201N</td>
</tr>
<tr>
<td>Psychology</td>
<td>3+</td>
<td>3</td>
<td>PSY 201</td>
</tr>
<tr>
<td>Biology</td>
<td>4+</td>
<td>12</td>
<td>BIO 101, BIO 102, BIO 103</td>
</tr>
<tr>
<td>Calculus AB</td>
<td>3+</td>
<td>4</td>
<td>MATH 251</td>
</tr>
<tr>
<td>Computer Science A</td>
<td>4+</td>
<td>4</td>
<td>CST 116</td>
</tr>
<tr>
<td>Computer Science AB</td>
<td>3+</td>
<td>4</td>
<td>CST 116</td>
</tr>
<tr>
<td>Physics B</td>
<td>4+</td>
<td>12</td>
<td>PHY 201, PHY 202, PHY 203</td>
</tr>
<tr>
<td>Physics C—Electricity and Magnetism</td>
<td>4+</td>
<td>4</td>
<td>PHY 222</td>
</tr>
<tr>
<td>Physics C—Mechanics</td>
<td>4+</td>
<td>4</td>
<td>PHY 221</td>
</tr>
<tr>
<td>Statistics</td>
<td>4+</td>
<td>4</td>
<td>MATH 361</td>
</tr>
<tr>
<td>History—World</td>
<td>3+</td>
<td>6</td>
<td>Social Science elective</td>
</tr>
<tr>
<td>Art—History</td>
<td>4+</td>
<td>8</td>
<td>Humanities elective</td>
</tr>
<tr>
<td>Art—Studio</td>
<td>4+</td>
<td>4</td>
<td>Humanities elective</td>
</tr>
<tr>
<td>Music Theory</td>
<td>4+</td>
<td>8</td>
<td>Humanities elective</td>
</tr>
</tbody>
</table>
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 Associate 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
OIT 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 adviser 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 Registrar.

The Registrar will determine whether the student has met the eligibility requirements outlined in this procedure. If so, the 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 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 OIT’s archive guidelines.

Catalog of Graduation
The student must meet all degree requirements from one OIT catalog. The catalog may be chosen from the year the student is first admitted and enrolled at OIT 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 OIT by obtaining written approval from their OIT major department and the Registrar. The agreed-upon catalog will be the one a student uses when he/she transfers to OIT. Students must enroll at OIT 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).

Undergraduate Grading Policy
OIT 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 as follows:

<table>
<thead>
<tr>
<th>LETTER GRADE</th>
<th>MEANING</th>
<th>POINTS PER CREDIT HOUR</th>
<th>USED TO CALCULATE GPA</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Exceptional</td>
<td>4</td>
<td>Yes</td>
</tr>
<tr>
<td>B</td>
<td>Superior</td>
<td>3</td>
<td>Yes</td>
</tr>
<tr>
<td>C</td>
<td>Average</td>
<td>2</td>
<td>Yes</td>
</tr>
<tr>
<td>D</td>
<td>Inferior</td>
<td>1</td>
<td>Yes</td>
</tr>
<tr>
<td>F</td>
<td>Failed</td>
<td>0</td>
<td>Yes</td>
</tr>
<tr>
<td>I</td>
<td>Incomplete</td>
<td>0</td>
<td>No</td>
</tr>
<tr>
<td>IP</td>
<td>In Progress</td>
<td>0</td>
<td>No</td>
</tr>
<tr>
<td>N</td>
<td>Audit</td>
<td>0</td>
<td>No</td>
</tr>
<tr>
<td>NP</td>
<td>No Pass:</td>
<td>0</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>Equated to a “D” or “F”</td>
<td></td>
<td></td>
</tr>
<tr>
<td>P</td>
<td>Pass:</td>
<td>0</td>
<td>No</td>
</tr>
<tr>
<td>W</td>
<td>Withdrawn</td>
<td>0</td>
<td>No</td>
</tr>
<tr>
<td>Z</td>
<td>No Grade Assigned</td>
<td>0</td>
<td>No</td>
</tr>
</tbody>
</table>

Honors

Special Recognition
Each spring a number of OIT 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.

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

Non-Standard Grading
Courses may be graded on the pass (P)/no pass (NP) basis at the discretion of the department and the 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 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.

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

<table>
<thead>
<tr>
<th>Class #</th>
<th>Title</th>
<th>Credits</th>
<th>Grade</th>
<th>Point Value for Credits</th>
<th>Earned Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>WRI 121</td>
<td>English Composition</td>
<td>3</td>
<td>B</td>
<td>3</td>
<td>9</td>
</tr>
<tr>
<td>ECO 201</td>
<td>Economics</td>
<td>3</td>
<td>C</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>MATH 111</td>
<td>College Algebra</td>
<td>4</td>
<td>A</td>
<td>4</td>
<td>16</td>
</tr>
<tr>
<td>CHE 101</td>
<td>Elementary Chemistry</td>
<td>3</td>
<td>B</td>
<td>3</td>
<td>9</td>
</tr>
<tr>
<td>CHE 104</td>
<td>Elementary Chemistry Lab</td>
<td>1</td>
<td>B</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>HED 250</td>
<td>Contemporary Health Issues</td>
<td>2</td>
<td>A</td>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td>PHED 190</td>
<td>Racquetball</td>
<td>1</td>
<td>B</td>
<td>3</td>
<td>3</td>
</tr>
</tbody>
</table>

\[
\text{GPA} = \frac{\text{Sum of earned grade points}}{\text{Credits attempted}} = \frac{54}{17} = 3.18
\]

Medical Withdrawal

Students requesting a medical withdrawal based on a physical or mental-health condition should consult with the Vice President for Student Affairs (VPSA) or designee. For more information, please refer to the Student Handbook.

Complete Withdrawal

If a student is currently registered and decides to withdraw from all classes, the student must notify the Registrar’s Office. Upon notification, the student will be required to complete the appropriate documentation.

1. Complete withdrawals from the university may be processed through Friday of the week prior to final-exam week.

2. Financial aid will be held for future terms after a complete withdrawal has been processed.

3. Depending on the time of the term, a complete withdrawal will result in a notation of a “complete withdrawal” or “Ws” on the student’s transcript.

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. Upon completion of the required coursework the “IP” grade will be replaced by a letter grade.

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:
   a. Register for the same course for credit.
   b. Challenge the course by examination.

Excessive Course Load
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 adviser and the Registrar. Appeals may be considered for special circumstances. The class schedule will provide associated tuition costs each term.

Substitution Within the Curriculum
Students desiring to depart from the curriculum prescribed in the catalog shall contact their departmental adviser 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 Assistant Provost and students should be given at least three weeks prior notice of the change.

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 OIT.

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. Given 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 OIT;
3. Be currently enrolled at OIT;
4. Have completed a minimum of 30 graded credits at OIT with minimum cumulative GPA of 3.0 or better since resuming studies at OIT;
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 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 adviser;
3. Rationale for the request.

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

Veterans Satisfactory-Progress Standards
The Veterans Coordinator administers the satisfactory-progress standards for students who are receiving educational benefits. The following satisfactory progress requirements apply:

1. Students must make satisfactory progress toward their certified educational objectives. They must satisfactorily complete all courses for which they have been certified.
2. Students who reduce their course load at any time during the term must notify the Veterans Coordinator of this reduction. Withdrawals from courses after the drop period may result in an overpayment of benefits unless there are mitigating circumstances.
3. Students must maintain a term GPA of 2.0 or better. A term GPA of less than 2.0 constitutes unsatisfactory progress.
4. The Veterans Administration will be notified by OIT within 30 days of any change in status or failure to meet satisfactory progress.
5. Students will be placed on probation at the end of the first term of unsatisfactory progress. The length of the probationary status is one term. Failure to meet satisfactory progress at the end of the probationary term could result in termination of benefits.

Graduation

Application for Graduation
Students must file an Application to Graduate and a Petition for Graduation 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 Programs offices and in academic departments. They are submitted to the Registrar’s Office for evaluation.

OIT Portland 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.

Grade Point Requirement
OIT requires a minimum cumulative GPA of 2.0 for graduation.

Graduation Residency Requirements
All degrees require students to take a minimum number of OIT courses. For an associate degree, a minimum of 30 term-credit hours must be taken from OIT. For a bachelor’s, a minimum of 45 term-credit hours must be taken from OIT. Credits earned through OIT course challenge or the OIT 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 OIT 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 OIT 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 OIT by obtaining written approval from their OIT major department and the Registrar. The agreed-upon catalog will be the one a student uses when he/she transfers to OIT. Students must enroll at OIT 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.

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. Forty-five credits are required if the first degree was not granted by OIT and students must meet the general-education requirements as outlined in their catalog of graduation. If the first bachelor’s degree was granted by OIT, 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 degree. Application for a minor must be submitted to the Registrar with the student’s petition to graduate.

General Education Requirements
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 OIT, the OIT general education requirements for the OIT baccalaureate may be waived subject to departmental program requirements.

Course Substitutions
Students may seek course substitution approval by completing the Course Substitution form and obtaining the signature of the adviser, department chair and 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 OIT 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) need to complete a Graduation-in-Absentia form in the Registrar’s Office to have the final transferring classes approved for their degree. This should be done prior to leaving OIT and beginning at the other college. The student must also complete the Petition for Graduation and turn it in at the same time for verification purposes.

Commencement
OIT’s graduation ceremony is held in June each year at which time degrees are granted to all who have satisfactorily completed all major and university general education requirements during the preceding spring term. Summer, fall and winter-term graduates who have already received diplomas may also participate in Commencement. Students who demonstrate the ability to graduate in the following summer term may also participate in Commencement ceremonies. However, summer graduates will not receive academic honors or diplomas at the spring commencement.

Diplomas
OIT awards diplomas at Commencement based on preliminary grades and preliminary degree checks for spring-term graduates. Students who receive a diploma at Commencement, but do not subsequently complete degree requirements, will be notified after the final degree check. The student will be asked to return the diploma. The university will place a hold on the student’s registration privileges and transcript if the diploma is not returned.

Those students with estimated failing or incomplete grades will receive a letter, rather than a diploma, inside the diploma cover. After completion of all degree requirements, these students will receive their diplomas in the mail. Diplomas will also be held until all fees and charges due OIT have been paid and exit interviews have been completed for Federal, Perkins and institutional loans.

Academic Honors
At each Commencement, OIT recognizes academically outstanding students who will receive their bachelor’s degree with academic honors. This honor is based on all OIT courses. To be eligible for honors a student must complete a minimum of 75 OIT 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 OIT credits and who are graduating from a Degree Completion program must complete a minimum of 45 graded OIT credits to be eligible for honors. For Degree Completion students, who fall into this category, honors are based on all OIT 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.
General Education Requirements

OIT’s General Education requirements provide breadth and depth to the OIT 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 OIT, 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 OIT’s faculty review the general education curriculum regularly. OIT’s goal for General Education is to help students become literate, informed, critical participants in a diverse and rapidly changing global society. If a student holds a baccalaureate degree or higher from a recognized, accredited institution, as determined by OIT, the general-education requirements for the OIT baccalaureate may be waived subject to departmental program requirements.

Baccalaureate General Education Requirements

Communication
SPE 111 Fundamentals of Speech
WRI 121 English Composition
WRI 122 English Composition

Plus nine credits from the following list:

Humanities
Nine credits selected by student or specified by a major department from the following:
ART–Art; ENG–Literature; HUM–Humanities; MUS–Music; PHIL–Philosophy; Languages (second year); COM 205*, COM 320*. 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
Twelve credits selected by student or specified by major department from the following:
ANTH – Anthropology; ECO – Economics (ECO 201N may not be used to satisfy both Business electives and Social Science general-education requirements.); 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. GEOG 105 and GEOG 115 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), mathematics (MATH), physical sciences (PHY), physical geography (GEOG 105 or GEOG 115) geology or physical anthropology (ANTH 101). At least four credits must be completed from a laboratory-based science course in BIO, CHE, GEOG 115 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.

* COM 205 and COM 320 may not be used to satisfy both Communication and Humanities credits.
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 Communication, COM 320 Advanced Intercultural Communication, ENG 381 Contemporary World Literature, SPAN 201/202/203 Second-Year Spanish.


Notes
Students who graduated from high school in 1997 or after, who did not complete two years of a foreign language in high school, must complete two terms of college-level foreign or second language in order to receive an OIT degree.

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

#### Degrees, Options, Minors, Specializations and Certificates

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Allied Health Partnerships
Marian Ewell, Department Chair

Degrees Offered
Bachelor of Science in Clinical Laboratory Science (joint degree, OIT and OHSU)
Bachelor of Science in Respiratory Care
Associate of Applied Science in Emergency Medical Technology—Paramedic (joint degree, OIT and OHSU)
Associate of Applied Science in Polysomnographic Technology

Certificate Offered
Polysomnographic Technology

The Department of Allied Health Partnership Programs offers undergraduate curricula in Clinical Laboratory Science, Emergency Medical Technology (Paramedic), Polysomnographic Technology, and Respiratory Care. Each program is designed to prepare individuals for professional practice in these specific health care specialties. The department is committed to training health care professionals through education, research, scholarship, clinical practice and community service. The curricula provide tools to effectively address changing health problems of society. Each of the programs is accredited by its respective accrediting agency and meets all requirements set forth in the standards of an accredited program.

The Department is located in the following sites:
- Clinical Laboratory Science Program: Oregon Health & Science University, Portland
- Paramedic Education Program: Tualatin Valley Fire and Rescue, Regional Training Center, Sherwood
- Polysomnographic Technology: Klamath Falls OIT Campus
- Respiratory Care Program: Klamath Falls OIT Campus

Enrollment in each program, except Polysomnographic Technology, is limited. Completion of the prescribed general university curriculum does not assure a student acceptance into the limited admission programs. Contact the respective program office in the fall term preceding anticipated enrollment to obtain admissions application information. Student selection is competitive with consideration to academic achievement, character and demonstrated interest.

Clinical Laboratory Science Program
Marian Ewell, Program Chair
Assistant Professors: M. Ewell
Associate Professor: A. Furman, S. Goodstein, C. Otto

Degree Offered
Bachelor of Science in Clinical Laboratory Science (joint degree, OIT and OHSU)

The Bachelor of Science in Clinical Laboratory Science (also called Medical Technology) prepares the student for entry into the clinical laboratory science profession.

Oregon Institute of Technology (OIT) and Oregon Health & Science University (OHSU) jointly offer the Clinical Laboratory Science Bachelor of Science Program, established in 1933 at OHSU. Students learn about laboratory sciences and develop skills in analytical thinking, problem solving, and communication to provide better health care. The structured laboratory program includes technical instruction and practical experience providing undergraduate university instruction at the senior level. The program comprises 12 months (4 consecutive terms on the OHSU campus beginning each fall term) followed by an extended fifth term, which is a 16-week clinical-laboratory externship. Completion leads to a joint baccalaureate degree from OIT and OHSU. Graduates are in demand and well prepared to enter the profession of clinical laboratory science.

Accreditation
The Clinical Laboratory Science Program is accredited by the National Accrediting Agency for Clinical Laboratory Science (NAACLS), a specialized accrediting body recognized by the Council for Higher Education Accreditation and/or the Secretary of the U.S. Department of Education. The contact information for NAACLS is:
National Accrediting Agency for Clinical Laboratory Sciences
5600 North River Road, Suite 720
Rosemont, IL 60018-5119
(773) 714-8880
(773) 714-8886 (fax)
info@naacls.org
http://www.naacls.org

Mission Statement
The mission of the OIT–OHSU CLS Program is to provide superior education to the students in the field of Clinical Laboratory Science. Our goals are to admit and retain students with demonstrated abilities from all segments of the population and to continue to provide students with a quality of education that meets or exceeds the national accreditation standards. Our expectation is to graduate individuals who are professionally competent; who possess a commitment to lifelong learning; who exhibit a sense of commitment to the ethical and humane aspects of patient care; who appreciate the need for research to develop knowledge of health, disease, health care management and education; and who recognize the role of the clinical laboratory scientist in the assurance of quality health care.

Admission Requirements

Admission to the Program as an OIT Freshman
During a student’s freshman year at OIT, he or she may apply for acceptance into the Early Admission to Clinical Laboratory Science Program track (EACLSP). Students who successfully complete this track will be automatically admitted to the clinical portion of the CLS program, conducted in Portland.

Students enrolled in the Early Admission to the Clinical Laboratory Science Program
requirements. Students with a baccalaureate degree will not have to meet OIT’s General Education requirements.

Undergraduate coursework of at least 103 term hours must include the following:
- At least 24 term credit hours of chemistry lectures and laboratory experience. Courses can be chosen from general chemistry, inorganic chemistry, organic chemistry, biochemistry, quantitative analysis and physical chemistry.
- At least 24 term credit hours of biological science lectures and laboratories. This must include at least one microbiology (bacteriology) class. Immunology is required as part of microbiology or as a separate course. Other recommended biology classes are genetics, physiology and anatomy. Survey courses do not qualify as fulfillment of chemistry or biological science prerequisites.
- One college-level mathematics course is required. Minimum requirements are met by MATH 111.

Individuals who have met admission requirements seven or more years prior to application to the Clinical Laboratory Science Program must complete additional academic work to qualify. This may be accomplished by one of three routes:
1. Completion of college-level courses in biochemistry and microbiology with a grade “C” or better.
2. Receiving credit by examination in biochemistry and microbiology; the examination grade must be equivalent to a grade “C” or better. This examination must be administered by an instructor at an accredited college or university. The OIT-OHSU CLS Program does not administer these examinations.
3. Achieving a CLEP score at or above the 50th percentile on both biology and chemistry examinations. Information can be obtained by writing to the Education Testing Service, CLEP, Box 592, Princeton, NJ 08540.

The Clinical Laboratory Science faculty determine clinical site assignment. Although students admitted into the Clinical Laboratory Science Program are guaranteed a clinical externship, due to limitations in available externship sites from year to year, student placement at a specific site may not be possible. Placement in a clinical externship is subject to the following:
1. All academic requirements must be met before commencement of the externship.
2. Externship placement occurs during the fourth term (summer term).
3. Students must comply with all externship facility requirements. This may include passing a drug test, and completing a request for criminal history.

Graduation Requirements
Students must maintain a minimum GPA of 2.00 to be eligible for graduation. In addition, a final grade of “C” or better in all student laboratory courses, as well as receiving a grade of “Pass” in all rotations in the clinical externship is required for graduation.

Professional CLS Program
Students spend the first four terms of the professional program (12 months) at OHSU in Portland in a combination of didactic lecture and student laboratory practice courses. Students become familiar with contemporary clinical laboratory procedures and instrumentation.

Clinical Practicum Externships
The structured 15-month (five contiguous terms) Clinical Laboratory Science Program includes a 16-week clinical laboratory externship. Clinical externships are predominantly located in hospital and reference laboratories throughout Oregon. Additional clinical laboratory training sites are located in Washington and Nevada. Under special circumstances, clinical sites have been utilized in other regions of the United States. The 16-week clinical laboratory externship is spent at the affiliated institution under the supervision of an adjunct clinical instructor. Students do not have classes on the OHSU or OIT campus during the 16-week clinical laboratory externship.

The Clinical Laboratory Science faculty determine clinical site assignment. Although students admitted into the Clinical Laboratory Science Program are guaranteed a clinical externship, due to limitations in available externship sites from year to year, student placement at a specific site may not be possible. Placement in a clinical externship is subject to the following:
1. All academic requirements must be met before commencement of the externship.
2. Externship placement occurs during the fourth term (summer term).
3. Students must comply with all externship facility requirements. This may include passing a drug test, and completing a request for criminal history.

Graduation Requirements
Students must maintain a minimum GPA of 2.00 to be eligible for graduation. In addition, a final grade of “C” or better in all student laboratory courses, as well as receiving a grade of “Pass” in all rotations in the clinical externship is required for graduation.
Bachelor of Science in Clinical Laboratory Science

Curriculum
All senior level courses require admission to the Clinical Laboratory Science Program or instructor consent. Required courses and recommended terms during which they should be taken:

Pre-Clinical Laboratory Science

Freshman Year Fall
BIO 231 Human Anatomy and Physiology I 4
MATH 111 College Algebra 4
WRI 121 English Composition 3
Intro elective* 2
Total 13

Freshman Year Winter
BIO 200 Medical Terminology 2
BIO 232 Human Anatomy and Physiology II 4
WRI 122 English Composition 3
Social Science elective 3
Total 12

Sophomore Year Fall
BIO 233 Human Anatomy and Physiology III 4
CLT 100 Introduction to Clinical Laboratory Science 2
SPE 111 Fundamentals of Speech 3
Humanities elective 3
Total 12

Sophomore Year Winter
BIO 209 Current Research Topics in Medical Sciences 1
BIO 346 Pathophysiology I 3
CHE 222 General Chemistry 5
WRI 327 Technical Report Writing 3
Total 12

Sophomore Year Spring
BIO 347 Pathophysiology II 3
CHE 223 General Chemistry 5
MATH 361 Statistical Methods I 4
Total 12

Junior Year Fall
CHE 331 Organic Chemistry I 4
SPE 321 Small Group and Team Communication 3
Humanities elective 3
Social Science elective 3
Total 13

Junior Year Winter
BIO 341 Medical Genetics 3
CHE 332 Organic Chemistry II 4
PHIL 331 Ethics in the Professions 3
Social Science elective 3
Total 13

Junior Year Spring
BIO 436 Immunology 4
CHE 103 Elementary Chemistry 3
CHE 106 Elementary Chemistry Laboratory 1
Humanities elective 3
Social Science elective 3
Total 14

Professional Courses

Senior Year Fall
CLS 406 Biometry 2
CLS 410 Clinical Microbiology I 2
CLS 420 Clinical Immunology 3
CLS 441 Practicum: Instrumentation 1
Group 1**

Total 12

Senior Year Winter
CLS 411 Clinical Microbiology II 2
CLS 415 Clinical Chemistry I 6
CLS 447 Practicum: Chemistry 6
CLS 448 Practicum: Immunology/Infectious Serology 2
CLS 449 Practicum: Urinalysis 2
Total 12

Senior Year Spring
CLS 412 Pathophysiology 2
CLS 416 Clinical Chemistry II 2
CLS 419 Immunohematology 2
CLS 461 Clinical Laboratory Management I Group 2**

Total 12

Senior Year Summer
CLS 440 Practicum: Specimen Collection 1
CLS 452 Practicum: Advanced Hematology Techniques 2
CLS 453 Practicum: Advanced Transfusion Medical Techniques 2
CLS 454 Practicum: Advanced Microbiology Techniques 2
CLS 457 Practicum: Advanced Chemistry/Immunology Techniques 2
CLS 459 Practicum: Advanced Urinalysis Techniques 1
CLS 462 Clinical Laboratory Management II 2
Total 14

Senior Year Fall
CLS 470 Clinical Laboratory Externship 16
CLS 463 Practicum: Clinical Laboratory Management III 1
Total 17

* Freshman fall Intro elective – choose one of the following:
  ACAD 105 Achieving Academic Success
  HED 240 Emergency Care & CPR
  HED 246 Drug and Alcohol Problems of Modern Society
  HED 250 Contemporary Health Issues
  HED 260 Diet and Exercise for Lifetime Fitness

** The class is divided into two groups. Students will be assigned to a group for practicum rotations.

Paramedic Education Program

Suzann Schmidt, Program Director

Todd Ellingson, M.D., Medical Director

Instructors: K. Darling, J. Dillingham, C. Kaptur, S. Schmidt

Adjunct Faculty: The program utilizes professional instruction from many of the faculty physicians, physician's assistants, and nurses at OHSU, as well as many other health care professionals from the community.

Degree Offered
Associate of Applied Science in Emergency Medical Technology–Paramedic (joint degree through OHSU and OIT).

The Associate of Applied Science in EMT–Paramedic (also called the Paramedic Education Program) prepares students for a clinical career as a paramedic. Upon completion of the program, graduates are eligible to sit for the National Registry EMT–Paramedic examination. Successful completion of the national examination process can lead to both national and Oregon certification.

The Paramedic Education Program was established in 1977 at Oregon Health & Science University. A collaborative program with Oregon Institute of Technology was initiated in 2001. Academic classes utilize facilities at both OHSU and Tualatin Valley Fire and Rescue, Regional Training Center. Clinical rotations utilize a variety of departments in Portland-area hospitals. The students complete a field externship.
practicum with one of a variety of agencies throughout the country, who are affiliated with the program.

**Accreditation**
The Paramedic Education Program is nationally accredited by The Committee on Accreditation of Educational Programs for the Emergency Medical Services Profession (CoAEMSP), a specialized accrediting body recognized by the Council for Higher Education Accreditation and/or the Secretary of the U.S. Department of Education.

**Mission Statement**
The mission of the Oregon Health & Science University/Oregon Institute of Technology Paramedic Education Program is to educate prehospital care providers; to prepare EMS leaders of the future; and to enhance the delivery of health care in the out-of-hospital setting.

**Career Opportunities**
Job opportunities are available for certified paramedics in a variety of settings. Paramedics work for ambulance agencies, fire departments, air-medical transport agencies, industrial sites, tactical-medical teams, and hospitals. Paramedic Education Program graduates often find employment opportunities from the agency where they completed their field externship, and are sought after by many fire and EMS agencies nationwide.

**Admission Requirements**
Students entering the Paramedic Education Program must have completed 37 credit hours of prerequisite courses prior to beginning the program. Prerequisite coursework includes the following required classes:

- At least 37 term credit hours of general education coursework including writing composition, public speaking, elementary algebra, human anatomy and physiology (12 credits at a 200 level or above), health and physical education, computer science, psychology, social science and an approved elective.
- Technical coursework required includes Emergency Medical Technician–Basic (EMT-B), EMT-B Cooperative Work Experience. Applicants must have an Oregon EMT–Basic certification by the beginning of fall term. Out-of-state applicants certified as EMTs may apply for Oregon reciprocity. Applicants are required to have work experience in health care, with a preference given to EMS experience, either volunteer or paid.

**Clinical and Field Externship Practicum**
The 12-month Paramedic Education Program is divided into three phases. Following 18 weeks of didactic studies in the classroom and skills lab setting, students enter a 16-week clinical rotation phase. During this phase of the program, student work under the supervision of paramedics, physicians, nurses, respiratory therapists, and other health care professionals. The clinical sites are primarily located at Oregon Health & Science University, with additional sites at five of the Portland-area hospitals and health care facilities.

Once students have successfully completed all requirements of the didactic and clinical phases of the program, they spend an additional 10 weeks working under the direct supervision of a Paramedic Field Training Officer responding to actual emergencies. Externship sites include locations in Oregon, Washington, Nevada, Texas, Colorado, Kansas and Missouri.

**Graduation Requirements**
Students must maintain a minimum GPA of 2.50 to be eligible for graduation. In addition, a “Pass” grade must be achieved for all clinical and externship requirements.

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**Associate of Applied Science in Emergency Medical Technology–Paramedic**

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

**Paramedic Professional Courses**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
<th>Term</th>
</tr>
</thead>
<tbody>
<tr>
<td>EMS 115</td>
<td>2</td>
<td>Fall</td>
</tr>
<tr>
<td>EMS 200</td>
<td>3</td>
<td>Winter</td>
</tr>
<tr>
<td>EMS 231</td>
<td>3</td>
<td>Spring</td>
</tr>
<tr>
<td>EMS 290</td>
<td>18</td>
<td>Summer</td>
</tr>
</tbody>
</table>

**Total Credit Hours for A.A.S. Degree in EMT–Paramedic:**
Prerequisite General Education: 37
Paramedic Course: 72
Total Credit Hours: 109
Polysomnographic Technology

Jane E. Perri, Program Director

Degrees Offered
This program is offered through Allied Health Partnerships. Students can choose from several degree options:

1. Certificate in Polysomnographic Technology. Students must successfully complete the core courses required to sit for a national exam. Successful completion of the certificate curriculum leads to eligibility to sit for the national Registered Polysomnographic Technologists examination (RPSGT).

2. Associate of Applied Science in Polysomnographic Technology. Students must successfully complete the courses in the certificate program for Polysomnographic Technology and other primarily general education courses. The degree completion courses can be taken from OIT or transferred from another college. Successful completion of the two-year curriculum leads to eligibility to sit for the national Registered Polysomnographic Technologists examination (RPSGT). Computer and Internet access is required.

3. Bachelor of Science in Allied Health Management: Emphasis in Polysomnography. After the student has successfully completed the RPSGT exam, they may complete health management courses that are offered through the OIT Management Department. Students may take the courses either in the classroom or via the distant education program while working in their hometown. (See the Management Department section of this catalog 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 Association of Polysomnographic Technologists.

Inquiries regarding accreditation should be directed to the Board of Registered Polysomnographic Technologists, 8201 Greensboro Drive, Suite 300, MacLean, VA 22102, (703) 610-9020. CAAHEP is a specialized accrediting body recognized by the Council for Higher Education Accreditation and/or the Secretary of the U.S., Department of Education.

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 exam administered by the Board of Registered Polysomnographic Technologists following the completion of the core 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 a distance 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 Distance Education Department or in the classroom. Not all of the required courses are available online and must be taken either in the OIT classroom or a local college and transferred. The writing courses are offered through the distance 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.

Admissions Procedures and 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. All applicants are required to submit an official Application for Admission to the Distance Education Department, accompanied by a $100 non-refundable fee and official transcripts of each college or university attended. Acceptance to the Polysomnographic Technology Degree Program is contingent upon acceptance to OIT. Detailed information and forms can be found on the OIT Distance Education Web site.

2. 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 OIT and that facility must be established prior to admission.

3. 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.
4. Candidates must submit immunization records prior to their clinical placement.
5. Criminal background clearance is required prior to acceptance and some clinical sites may require drug screening.

**Graduation Requirements**

Minimum graduation requirements for the A.A.S are the successful completion of 48 credit hours of general education courses and 42 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, 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 the OIT campus in Klamath Falls, Oregon or to Dayton, Ohio for one day of residency. Passage of these exams is required to complete the certificate program.

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 two clinical polysomnographic technology courses require placement in clinical sites. Students are reponsible for selecting an accredited sleep disorder facility prior to admission into the program. Site agreements between OIT and the accredited facility must be in place for the student to begin these courses. On-site preceptors will work in conjunction with OIT faculty to ensure an excellent training experience.

**Polysomnographic Technology Certificate**

**Curriculum**

A certificate will be awarded to students completing 44 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:

<table>
<thead>
<tr>
<th>Course #</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIO 231</td>
<td>Human Anatomy and Physiology I</td>
<td>4</td>
</tr>
<tr>
<td>BIO 232</td>
<td>Human Anatomy and Physiology II</td>
<td>4</td>
</tr>
<tr>
<td>BIO 233</td>
<td>Human Anatomy and Physiology III</td>
<td>4</td>
</tr>
<tr>
<td>MATH 243</td>
<td>Introductory Statistics</td>
<td>4</td>
</tr>
<tr>
<td>SPE 111</td>
<td>Fundamentals of Speech</td>
<td>3</td>
</tr>
<tr>
<td>WRI 121</td>
<td>English Composition</td>
<td>3</td>
</tr>
<tr>
<td>WRI 122</td>
<td>English Composition</td>
<td>3</td>
</tr>
<tr>
<td>WRI 227</td>
<td>Technical Report Writing</td>
<td>3</td>
</tr>
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<td>Total</td>
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<td>46</td>
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</table>

**Total Credit Hours for A.A.S. Degree in Polysomnography**

<table>
<thead>
<tr>
<th>Polysomnographic Technology Certificate Courses</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIO 231</td>
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<tr>
<td>BIO 232</td>
<td>4</td>
</tr>
<tr>
<td>BIO 233</td>
<td>4</td>
</tr>
<tr>
<td>MATH 243</td>
<td>4</td>
</tr>
<tr>
<td>SPE 111</td>
<td>3</td>
</tr>
<tr>
<td>WRI 121</td>
<td>3</td>
</tr>
<tr>
<td>WRI 122</td>
<td>3</td>
</tr>
<tr>
<td>WRI 227</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td>46</td>
</tr>
</tbody>
</table>

**Associate of Applied Science in Polysomnographic Technology**

**Curriculum**

All courses in the Certificate Program and additional courses below are required to earn the A.A.S. degree:

<table>
<thead>
<tr>
<th>Course #</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIO 231</td>
<td>Human Anatomy and Physiology I</td>
<td>4</td>
</tr>
<tr>
<td>BIO 232</td>
<td>Human Anatomy and Physiology II</td>
<td>4</td>
</tr>
<tr>
<td>BIO 233</td>
<td>Human Anatomy and Physiology III</td>
<td>4</td>
</tr>
<tr>
<td>MATH 243</td>
<td>Introductory Statistics</td>
<td>4</td>
</tr>
<tr>
<td>PSY</td>
<td>Psychology (PSY 201, PSY 202 or PSY 203)</td>
<td>3</td>
</tr>
<tr>
<td>SPE 111</td>
<td>Fundamentals of Speech</td>
<td>3</td>
</tr>
<tr>
<td>WRI 121</td>
<td>English Composition</td>
<td>3</td>
</tr>
<tr>
<td>WRI 122</td>
<td>English Composition</td>
<td>3</td>
</tr>
<tr>
<td>WRI 227</td>
<td>Technical Report Writing</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>46</td>
</tr>
</tbody>
</table>

| Math/Science/Social Science elective            | 6       |
| Humanities elective                              | 3       |
| Electives                                       | 6       |
| Total                                           | 90      |
Respiratory Care Program

James Hulse, Program Director
Jeff Pardy, Director Clinical Education
John Ordal, Medical Director
Participating Faculty: D. Applegate, A. Bell, P. Cabrera, K. Christensen, D. Davis, P. Finch, J. Harris, J. Johnson, L. McLaughlin, K. Rabe, D. Stone, A. Venes, D. Venes, T. Williams

Degrees 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 examination and state licensure.

Accreditation
The Respiratory Care Program is fully accredited by the Committee on Accreditation for Respiratory Care (CoARC), 1248 Harwood Rd., Bedford, TX 76021, (800) 874-5615.

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 in the health care setting as a member of the healthcare 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 program based on cumulative grade-point average and nonsmoking status.

Students are strongly advised to complete all 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 Programs
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 externally, utilizing mail, e-mail, fax and Internet delivery, and requires collaborative learning. Students must participate in an orientation. Upon receipt of the necessary documentation, college credit will be given to qualified applicants for having passed the Registered Respiratory Therapist (RRT) examination. 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 OIT general education requirements for graduation. The Respiratory Care Degree Completion Program includes the presentation and publication 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 186 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 SAE examinations and take and pass the CRT and RRT examinations as a condition of BS degree completion.
Bachelor of Science in Respiratory Care

Curriculum
Required courses and terms during which they may be taken.

Pre-Respiratory Care
<table>
<thead>
<tr>
<th>Freshman Year</th>
<th>Fall</th>
<th>Subject</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIO 231</td>
<td>Fall</td>
<td>Human Anatomy and Physiology I</td>
<td>4</td>
</tr>
<tr>
<td>CHE 101</td>
<td>Fall</td>
<td>Elementary Chemistry</td>
<td>3</td>
</tr>
<tr>
<td>CHE 104</td>
<td>Fall</td>
<td>Elementary Chemistry Laboratory</td>
<td>1</td>
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<tr>
<td>MATH 111</td>
<td>Fall</td>
<td>College Algebra</td>
<td>1</td>
</tr>
<tr>
<td>or MATH 243</td>
<td>Fall</td>
<td>Introductory Statistics</td>
<td>4</td>
</tr>
<tr>
<td>WRI 121</td>
<td>Fall</td>
<td>English Composition</td>
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<thead>
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<th>Freshman Year</th>
<th>Winter</th>
<th>Subject</th>
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<tbody>
<tr>
<td>BIO 232</td>
<td>Winter</td>
<td>Human Anatomy and Physiology II</td>
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<td>PSY</td>
<td>Winter</td>
<td>Psychology (PSY 201, PSY 202 or PSY 203)</td>
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<tr>
<td>RCP 100</td>
<td>Winter</td>
<td>Introduction to Respiratory Care</td>
<td>2</td>
</tr>
<tr>
<td>RCP 231</td>
<td>Winter</td>
<td>Pulmonary Physiology</td>
<td>4</td>
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<tr>
<td>WRI 122</td>
<td>Winter</td>
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<th>Fall</th>
<th>Subject</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>BIO 230</td>
<td>Fall</td>
<td>Medical Terminology</td>
<td>2</td>
</tr>
<tr>
<td>BIO 233</td>
<td>Fall</td>
<td>Human Anatomy and Physiology III</td>
<td>4</td>
</tr>
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<td>SPE 111</td>
<td>Fall</td>
<td>Fundamentals of Speech</td>
<td>3</td>
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<td></td>
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<td>Humanities elective</td>
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<td></td>
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<td>Social Science elective</td>
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<table>
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<tr>
<th>Sophomore Year</th>
<th>Winter</th>
<th>Subject</th>
<th>Credits</th>
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<tbody>
<tr>
<td>BIO 220</td>
<td>Winter</td>
<td>Cardiovascular Physiology</td>
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<tr>
<td>BIO 336</td>
<td>Winter</td>
<td>Essentials of Pathophysiology</td>
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<td>COM 205</td>
<td>Winter</td>
<td>Intercultural Communication</td>
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<tr>
<td>RCP 235</td>
<td>Winter</td>
<td>Arterial Blood Gases</td>
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<tr>
<td></td>
<td></td>
<td>Social Science elective</td>
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</tr>
<tr>
<td>Total</td>
<td>Winter</td>
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Bachelor's Degree Completion Respiratory Care
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.

Admission Requirements
1. Complete the online Degree Completion Program Application for Admission.
2. Mail your application, a copy of your registry certificate, and a check for $100 made out to Oregon Institute of Technology, to the Distance Education Office.
3. Request official transcripts from all colleges you have attended to the Distance Education Office.
4. Request a letter of good standing from NBRC be mailed to the OIT Distance Education Office. This letter will enable the Registrar to grant college credit based on your registry.

Courses granted for Registered Respiratory Therapist (RRT)
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<td>RCP 335</td>
<td>Pulmonary Rehabilitation and Geriatrics</td>
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<td>RCP 336</td>
<td>Hyperinflation Therapies</td>
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OIT Degree Completion Courses
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* Complete 6 credits from one of the technical areas listed below:
  Advanced Respiratory Care Studies: RCP 486, RCP 487, RCP 488.
  Education: AHED 450, AHED 451, AHED 452 or AHED 460
  Management: BUS 316, BUS 317, or BUS elective approved by adviser.
  Polysomnography: PSG 221, PSG 231 (6 credits), or PSG elective approved by adviser.
## Prerequisite/Transfer Courses

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<td>Human Anatomy and Physiology III</td>
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<td>MATH 243</td>
<td>Introductory Statistics</td>
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Civil Engineering

Michael Cornachione, Department Chair

Roger Lindgren, Program Director, Master of Science in Civil Engineering

Roger Lindgren, Curriculum Coordinator

Professors: H. Cornachione, M. Cornachione

Associate Professor: R. Lindgren

Assistant Professors: S. St.Clair, C. Riley, D. Thaemert

The field of civil engineering is concerned with the responsible planning, design, construction and maintenance of the nation’s infrastructure. Civil engineers design highways, bridges, buildings, dams, communities, and water and waste management systems for the enhancement of human welfare and protection of our environment.

Degree Offered

Master of Science in Civil Engineering Bachelor of Science in Civil Engineering

Program Objectives

The department offers a bachelor’s degree in civil engineering. Graduates from this program will:

1. Be able to practice civil engineering.
2. Be able to pursue advanced education in civil engineering or a related field.
3. Act as responsible, effective and ethical citizens.
4. Understand and effectively communicate the realistic constraints of civil engineering.
5. Be able to perform effectively in a multi-disciplinary environment.

Students enjoy a close relationship with full-time faculty who are licensed professionals with many years of practical experience. Course offerings promote education in relevant theory common to all branches, 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 design projects appropriate to the freshman level. While most freshman and sophomore courses are intended to provide a solid background in mathematics, communications, basic sciences, and engineering sciences, certain courses provide additional concepts and methodologies supporting more advanced engineering design.

In junior Civil Engineering courses, students develop a broad engineering base. Junior courses include topics in structural, geotechnical, transportation, and environmental engineering as well as project management.

In the senior 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 senior project also involves realistic constraints including cost considerations, socioeconomic impacts, aesthetic choices, and ethical deliberations. Graduating seniors will prepare for the Fundamentals of Engineering (FE) examination as a first step toward licensure as a professional engineer.

To ensure graduates can become responsible, effective citizens and have begun to build a foundation for lifelong learning, students are required to satisfy OIT general education requirements in communication, business, humanities, social sciences, technology, 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, physics, and computer-aided drafting are desirable for entry into the Civil Engineering Program.

Career Opportunities

Upon completing the core curriculum, civil engineering students have a solid foundation in structural, geotechnical, transportation and environmental engineering. Students can then target specific careers within the broad field of civil engineering.

Structural engineering involves the planning, analysis and design of buildings and other structures. Graduates will utilize a variety of analysis techniques and design in the principle construction materials of wood, steel and concrete. Graduates will be exposed to recent and emerging practices in green building design and technology.

Geotechnical engineering includes the design of building foundations and retaining structures, as well as slope stability, groundwater and drainage considerations, materials testing, and inspection. State and federal highway departments and private geotechnical engineering consulting firms typically employ graduates.

Construction management requires knowledge of traditional management methods including planning, estimating and scheduling for projects as well as sustainable design principles and collaborative and integrated design models. Graduates may work with construction companies or consultants and in various capacities such as construction superintendents, project managers, project engineers or company owners.

Transportation engineering is concerned with the planning, design, construction, operation, performance, evaluation, maintenance, and rehabilitation of transportation systems and facilities, such as highways, railroads, urban transit, and air transportation systems. Graduates have career opportunities with consulting firms, government agencies, and industry.

Environmental and water resource engineering continue to be expanding fields due to the heightened environmental awareness and interest in sustainable practice and resulting regulatory mandates. Graduates have opportunities in planning, design, operation and maintenance of hydraulic and water resource projects, water and wastewater treatment facilities and remediation of existing environmental problems, or can work with regulatory and compliance issues related to resource and waste management. Graduates have career opportunities with consult-
ing firms, a broad spectrum of government agencies and industry.

**Accreditation**

The Civil Engineering Program is accredited by the Engineering Accreditation Commission (EAC) of ABET, 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 advisers to transition to meet the requirements of the current catalog.

A minimum of 182 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 courses with CIV, GME, MATH, CHE, and PHY prefixes and ENGR 211, ENGR 213, and ENGR 231. Students must also earn a grade of “C” or better in all courses listed as prerequisites for these courses. In addition to the listed prerequisites for all civil engineering classes, registration for all 300-level CIV courses require completion of PHY 222 and MATH 254N with a “C” or better.

**Degree Requirements—Master of Science**

The Master of Science in Civil Engineering requires completing 45 credit hours of graduate work. Both thesis and project options are available; students must complete 12 credits toward a thesis or 9 credits toward an approved project. Graduate course offerings emphasize the civil engineering disciplines of structural and transportation engineering. See the graduate program director for more information.

**Bachelor of Science in Civil Engineering**

**Curriculum**

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

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<td>CHE 204 General Chemistry Lab</td>
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<td>CIV 371 Introduction to</td>
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* Humanities courses may not be skill or performance based. Students must take either ANTH 335 The Built Environment or HIST 335 The Engineering Profession as one of their social science electives.

**  Students must take either CHE 231 (1 credit hour) and CHE 232 (2 credit hours) as a three credit hour component or CHE 455 as one of their math/science electives. The remaining math/science elective must demonstrate an advancement in educational content in BIO, CHE, MATH, or PHY.

• Additional mathematics work in probability/statistics, linear algebra, numerical analysis and advanced calculus is encouraged.

• CHE, MATH and PHY courses must not be lower than courses in required curriculum.
Communication Department
Linda Young, Department Chair

Professors: M. Dyrud, V. Vance, L. Young

Associate Professors: K. Brown, J. Murray, M. Phillips, J. Puckett

Assistant Professors: V. Ball, D. Peterson, M. Schnackenberg

Instructors: J. Calvo, R. Schwartz

Degree Offered
Bachelor of Science in Communication Studies

The Bachelor of Science in Communication Studies allows 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.

Minors Offered
Human Communication
Technical Communication

Certificate Offered
Dispute Resolution

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 OIT’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.

Bachelor of Science in Communication Studies

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

Freshman Year  Fall
COM 104  Introduction to Communication  3
COM 115  Introduction to Mass Communication  3
COM 225  Interpersonal Communication  3
PSY 201  Psychology  3
WRI 121  English Composition  3
Total  15

Freshman Year  Winter
COM 105  Introduction to Communication Theory  3
HUM 125  Introduction to Technology, Society and Values  3
PSY 202  Psychology  3
WRI 122  English Composition  3
Social Science elective  3
Total  15

Freshman Year  Spring
COM 106  Introduction to Communication Research  3
MATH 105  Collegiate Mathematics
or MATH 111  College Algebra
or MATH 243  Introductory Statistics  4
PSY 203  Psychology  3
SPE 111  Fundamentals of Speech Communication  3
Elective  3
Total  16

Sophomore Year  Fall
JOUR 211  Publications—Student Newspaper  3
SPE 321  Small Group and Team Communication  3
WRI 227  Technical Report Writing  3
Laboratory Science elective  4
Elective  3
Total  16

Sophomore Year  Winter
COM 276  Democracy and Media  3
Focused Sequence elective*  3
Focused Sequence elective*  3
Laboratory Science/Math elective  4
Elective  3
Total  16

Sophomore Year  Spring
COM 205  Intercultural Communication  3
COM 237  Introduction to Visual Communication  3
COM 255  Communication Ethics  3
Focused Sequence elective*  3
Laboratory Science/Math elective  4
Total  16

Junior Year  Fall
COM 326  Communication Research  3
ECO 202N Principles of Economics, Macroeconomics  3
Focused Sequence elective*  3
Focused Sequence elective*  3
Major elective**  3
Total  15

Junior Year  Winter
COM 345  Organizational Communication  3
COM 301  Rhetorical Theory and Application  3
Major elective (upper-division)**  3
Major elective (upper-division)**  3
Total  15

Junior Year  Spring
Focused Sequence elective*  3
Humanities elective  3
Major elective**  3
Major elective (upper-division)**  3
Major elective (upper-division)**  3
Total  15

Senior Year  Fall
Senior Project I***  3
Focused Sequence elective****  3
Elective (upper-division)  3
Elective (upper-division)  3
Elective  3
Total  15

Senior Year  Winter
Senior Project II***  3
Business elective  3
Focused Sequence elective (upper-division)*  3
Social Science elective (upper-division)  3
Elective (upper-division)  3
Elective  3
Total  15
Senior Year

**COM 423** Senior Project III*** 3
Focused Sequence elective (upper-division)* 3
Social Science elective (upper-division) 3
Social Science elective (upper-division) 3
Elective 3

or **COM 420** Externship*** 15

Total 15

* Chosen by students from a list of focused sequence of electives and developed in consultation with their adviser. The focused sequence totals 30 units of the student’s choice; three credits must be upper-division.

** Chosen by students from a list of Communication, Organizational Communication, and Technical Communication electives (six credits required of each; minimum of 12 credits upper-division; minimum one upper-division writing course which meets general education Communication requirements.)

*** During the senior year, students will complete a capstone project, either a senior project or externship, in which they apply and integrate the skills gained in their courses. The senior project will be completed under the supervision of a faculty adviser and will span the academic year. Externships will be concentrated in one or more terms and will require supervision of a faculty adviser.

**** For senior project students, this focused sequence elective must be upper-division.

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

**Major Elective Courses**

Students will select electives from three categories—Communication, Organizational Communication and Technical Communication—and include two courses (6 credits) from each category, for a total of 18 required credits. A minimum of 12 credits must be upper-division. Please note that some electives require prerequisites.

**Communication (6 credits)**

COM 215 Creativity in Communication
COM 216 Mastery of Grammar and Punctuation
COM 226 Nonverbal Communication
COM 248 Digital Media Production
COM 320 Advanced Intercultural Communication
COM 358 Communication and the Law
COM 425 Mediation
COM 426 Mediation Practicum
JOUR 311 Advanced Publications—Student Newspaper

**Organizational Communication (6 credits)**

COM 256 Public Relations
COM 347 Negotiation and Conflict Resolution
COM 348 Facilitation
COM 357 Communication and Leadership
COM 445 Organizational Communication II
COM 446 Communication and Leadership

**Technical Communication (6 credits)**

COM 365 Electronic Communication and Society
WRI 214 Business Correspondence
WRI 327 Advanced Technical Writing
WRI 350 Documentation Development
WRI 410 Proposal and Grant Writing
WRI 415 Technical Editing
WRI 420 Document Design

Curriculum notes: To earn the Bachelor of Science degree, students must complete 45 credits in mathematics, science, and social science. Students must also complete 60 credits of upper-division courses.

**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.

**Human Communication Minor**

The Human Communication Minor supplements OIT technical degrees and provides advanced training in communication skills. The minor offers courses in the analysis and practice of human communication in a variety of areas including interpersonal, intercultural, health, nonverbal and electronic communication. In addition, the minor allows students to practice conflict resolution, negotiation strategies, ethical communication and rhetorical analysis. 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.

**Technical Communication Minor**

The Technical Communication Minor supplements OIT 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 the Communication Department faculty member.
Career Opportunities
The 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 OIT prepares students well. Second, the 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 Technical Communication Minor may increase job opportunities and professional advancement.

Requirements of the Minor
In addition to the general education requirements in communication, Technical Communication Minor students take four upper-division courses (12 units). Students take two required core courses and choose two electives from the list below. Students must earn a “C” or better in all courses to complete the minor.

Required Courses
COM 301 Rhetorical Theory and Application
WRI 328 Technical Journalism

Elective Courses
COM 365 Electronic Communication and Society
COM 415 Developing Effective Multimedia-based Presentations
WRI 350 Documentation Development
WRI 410 Proposal and Grant Writing
WRI 415 Technical Editing
WRI 420 Document Design

Dispute Resolution Certificate
The Dispute Resolution Certificate provides students with both the theoretical background and the practical experience to effectively resolve conflicts in a variety of contexts.

Prerequisite or Co-requisite Classes
SPE 111 Fundamentals of Speech 3
WRI 121 English Composition 3
WRI 122 English Composition II 3

Program Courses
COM 205 Intercultural Communication 3
COM 225 Interpersonal Communication 3
COM 226 Nonverbal Communication 3
COM 345 Organizational Communication I 3
COM 347 Negotiation and Conflict Resolution 3
COM 348 Facilitation 3
COM 425 Mediation 3
COM 426 Mediation Practicum 3
SPE 321 Small Group and Team Communication 3
Computer Systems Engineering Technology Department

Calvin Caldwell, Department Chair
Jay Bockelman, Portland Operations Program Director, Software Engineering Technology
Todd Breedlove, Program Director, Software Engineering Technology
Doug Lynn, Program Director, Computer Engineering Technology
Jim Long, Curriculum Coordinator, Software Engineering Technology
Phong Nguyen, Curriculum Coordinator, Computer Engineering Technology

Professors: R. Albert, J. Bockelman, R. Carestia, C. Caldwell, C. Kansaku, D. Metzler, S. Yang
Associate Professors: M. Breck, T. Breedlove, J. Long, D. Lynn, P. Nguyen

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, the Bachelor of Science in Software Engineering Technology, the Bachelor of Science in Embedded Systems Engineering Technology, the Associate of Engineering in Computer Engineering Technology and the Associate of Engineering in Software Engineering Technology, all share a common first-year curriculum.

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

Freshman Year Fall
CST 103 Introduction to Computer Systems I 2
CST 162 Introduction to Digital Logic 4
MATH 111 College Algebra 4
WRI 121 English Composition 3
Total 16

Freshman Year Winter
CST 104 Introduction to Computer Systems II 1
CST 116 C++ Programming I 4
CST 130 Computer Organization 3
MATH 112 Trigonometry 4
WRI 122 English Composition 3
Total 15

Freshman Year Spring
CST 105 Introduction to Computer Systems III 1
CST 126 C++ Programming II 4
CST 131 Computer Architecture 3
MATH 251 Differential Calculus 4
SPE 111 Fundamentals of Speech 3
Total 15

Computer Engineering Technology

Degrees Offered
Bachelor of Science in Computer Engineering Technology
Associate of Engineering in Computer Engineering Technology

Bachelor of Science and Associate of Engineering Degrees
All students who complete the curriculum requirements in Computer Engineering Technology will be knowledgeable in the theory and applications of both computer hardware and software.

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 OIT.

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. It 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 a technologist. 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 educa-
tion incorporating industry-relevant, applied laboratory based design and analysis to students. The program is to serve a constituency consisting of its students, high-technology industry and the citizens of Oregon. 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 graduates.
- Expose students to cross-disciplinary educational program.
- Provide high tech industry employers with graduates in the computer engineering technology profession, a profession which is increasingly being driven by advances in technology.

### CET Bachelor of Science Program Educational Objectives

1. Graduates of the Computer Engineering Technology (CET) Bachelor’s Degree Program will possess the ability to analyze, test and solve hardware and software computer engineering problems, using the basic principles of physics, mathematics and applied engineering. They will be able to use modern engineering techniques, skills and tools, particularly recognizing the role that computers play in applied engineering. They will be able to identify, formulate and solve computer engineering problems that are subject to realistic constraints.

2. Graduates of the CET Bachelor’s Degree Program will be able to apply the knowledge and skills from their education in order to understand the impact of computer engineering and technological solutions in an environment consistent with the principles of applied engineering design and development.

3. Graduates of the concurrent degree program will be technically competent with aspects of software technologies and electronics as appropriate to the discipline within each student’s technical interests and professional goals. They will have the ability to apply undergraduate fundamentals in all discipline areas within the field and be able to apply the results to software/hardware/electronic co-design.

4. Graduates of the CET bachelor’s program will have developed a broad base of skills preparing them for professional practice as engineering technologists. They will practice with ethical and professional responsibility; recognize the need for, and have the ability to engage in, continual learning pertaining to advances in technology; and have the ability to function and communicate effectively, both individually and within teams.

### CET Associate Degree Program Education Objectives

The CET associate degree is intended to serve a number of purposes. It provides primarily a way for students obtaining a bachelor degree in software (or other related degrees) to add breadth to their education. It also provides an educational option preparing students for employment as technicians.

Graduates of the Computer Engineering Technology (CET) Associate Degree Program will:

1. Possess the ability to test hardware and solve software problems, using the basic principles of electronics, physics, mathematics and applied engineering. They will be able to use modern techniques, skills and tools.

2. Apply the knowledge and skills from their education in order to understand the role of computer and technological solutions in an industrial environment.

3. Be technically competent with aspects of software technologies and electronics as appropriate to the discipline within each student’s technical interests.

4. Have developed a broad base of skills preparing them to be able to pursue professional practice as computer technicians. They will practice ethically and responsibly; recognize the need for, and have the ability to engage in, continual learning as pertaining to advances in technology; and have the ability to function and communicate effectively, both individually and within teams.

5. Have developed a broadened appreciation of hardware functionality and its limitations enabling them to be able to use and directly interface with hardware, when they have obtained an SET bachelor’s degree in conjunction with the associate degree.

### 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 possess an Associate of Engineering degree in Computer Engineering Technology to be considered for this program.

### Accreditation

The Computer Engineering Technology Programs are accredited by the Technology Accreditation Commission (TAC) of the Accreditation Board for Engineering Technology (ABET), 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.

### Degree Requirements

Associate of engineering technology degree students must complete 96 credit hours as prescribed by the curriculum outline. The Bachelor of Science in Computer Engineering Technology degree requires 91 additional credit hours, for a total of 187 credits, as prescribed by the curriculum outline.
### Bachelor of Science in Computer Engineering Technology

#### Curriculum

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

**Freshman Year Fall**
- CST 103: Introduction to Computer Systems I 2
- CST 162: Introduction to Digital Logic 4
- MATH 111: College Algebra 4
- WRI 121: English Composition 3
- Social Science elective 3
- **Total 16**

**Freshman Year Winter**
- CST 104: Introduction to Computer Systems II 1
- CST 116: C++ Programming I 4
- CST 130: Computer Organization 3
- MATH 112: Trigonometry 4
- WRI 122: English Composition 3
- **Total 15**

**Freshman Year Spring**
- CST 105: Introduction to Computer Systems III 1
- CST 126: C++ Programming II 4
- CST 131: Computer Architecture 3
- MATH 251: Differential Calculus 4
- SPE 111: Fundamentals of Speech 3
- **Total 15**

**Sophomore Year Fall**
- CST 133: Digital Electronics II – Sequential Logic with HDL 4
- CST 250: Computer Assembly Language 4
- MATH 252: Integral Calculus 4
- PSY 201: Psychology 3
- WRI 227: Technical Report Writing 3
- **Total 18**

**Sophomore Year Winter**
- CST 204: Introduction to Microcontrollers 4
- EE 221: Circuits I – DC and 1st Order Transient Analysis 4
- CST 231: Computer Design with Programmable Logic 3
- CST 232: Computer Design with Programmable Logic Laboratory 1
- MATH 254N: Vector Calculus I 4
- **Total 16**

**Sophomore Year Spring**
- CST 313: Computer Software Techniques 3
- EE 223: Circuits II – AC and 2nd Order Transient Analysis 4
- SPE 321: Small Group and Team Communication 3
- Advanced Math elective** 4
- Humanities elective 3
- **Total 17**

* Technical elective: CST 136, CST 415, or CST 407.
** Electives: MATH 253N or MATH 341 are also acceptable provided the student earns a total of 36 credits in Math and Science.

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### Associate of Engineering in Computer Engineering Technology

#### Curriculum

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

**Freshman Year Fall**
- CST 103: Introduction to Computer Systems I 2
- CST 162: Introduction to Digital Logic 4
- MATH 111: College Algebra 4
- WRI 121: English Composition 3
- Social Science elective 3
- **Total 16**

**Freshman Year Winter**
- CST 104: Introduction to Computer Systems II 1
- CST 116: C++ Programming I 4
- CST 130: Computer Organization 3
- MATH 112: Trigonometry 4
- WRI 122: English Composition 3
- **Total 15**

**Freshman Year Spring**
- CST 133: Digital Electronics II – Sequential Logic with HDL 4
- CST 250: Computer Assembly Language 4
- MATH 252: Integral Calculus 4
- PSY 201: Psychology 3
- WRI 227: Technical Report Writing 3
- **Total 18**

**Sophomore Year Fall**
- CST 204: Introduction to Microcontrollers 4
- EE 221: Circuits I – DC and 1st Order Transient Analysis 4
- CST 231: Computer Design with Programmable Logic 3
- CST 232: Computer Design with Programmable Logic Laboratory 1
- MATH 254N: Vector Calculus I 4
- **Total 16**

**Sophomore Year Spring**
- CST 313: Computer Software Techniques 3
- EE 223: Circuits II – AC and 2nd Order Transient Analysis 4
- PHY 222: General Physics with Calculus 4
- Humanities elective 3
- Elective 2
- **Total 16**
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 CST 313, WRI 327, the CST elective and the MATH elective.

CST 136 Object-Oriented Programming with C++ 4
CST 211 Data Structures 4
CST 229 Introduction to Grammars 4
CST 238 Graphical User Interface Programming 4
CST 240 UNIX 3
CST 320 Compiler Methods 4
CST 324 Database Systems and Design 4
CST 334 Project Proposal 1
CST 352 Operating Systems 4
CST 412 Senior Development Project 3
CST 422 Senior Development Project 3
CST 432 Senior Development Project 2
CST 415 Computer Networks 4
CST Technical electives 6
MATH elective* 3/4
MATH 465 Mathematical Statistics 4
WRI 350 Documentation Development 3

* One elective must be a CET hardware technical elective—a Hardware CST 407.
* One elective must be a SET software technical elective—CST 346, CST 356, CST 405, a Software CST 407, CST 425, CST 426, CST 462, or CST 465.
** MATH 321, MATH 322, MATH 341, MATH 342, or MATH 451.

Embedded Systems Engineering Technology

Degrees Offered
Bachelor of Science in Embedded Systems Engineering Technology

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 OIT.

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 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:

• 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 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.
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.

Degree Requirements
The Bachelor of Science in Embedded Systems Engineering Technology requires 187 credit hours as prescribed by the curriculum outline.

Bachelor of Science in Embedded Systems Engineering Technology

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

Freshman Year  Fall
CST 103 Introduction to Computer Systems I 2
CST 162 Introduction to Digital Logic 4
MATH 111 College Algebra 4
WRI 121 English Composition 3
Social Science elective 3
Total 16

Freshman Year  Winter
CST 104 Introduction to Computer Systems II 1
CST 116 C++ Programming I 4
CST 130 Computer Organization 3
MATH 112 Trigonometry 4
WRI 122 English Composition 3
Total 15

Freshman Year  Spring
CST 105 Introduction to Computer Systems III 1
CST 126 C++ Programming II 4
CST 131 Computer Architecture 3
MATH 251 Differential Calculus 4
SPE 111 Fundamentals of Speech 3
Total 15

Sophomore Year  Fall
CST 133 Digital Electronics II—Sequential Logic with HDL 4
CST 136 Object-Oriented Programming with C++ 4
CST 250 Computer Assembly Language 4
MATH 252 Integral Calculus 4
Total 16

Sophomore Year  Winter
CST 204 Introduction to Microcontrollers 4
CST 231 Computer Design with Programmable Logic 3
CST 232 Computer Design with Programmable Logic Laboratory 1
EE 221 Circuits I–DC and 1st Order Transient Analysis 4
MATH 254N Vector Calculus I 4
Total 16

Sophomore Year  Spring
CST 211 Data Structures 4
EE 223 Circuits II – AC and 2nd Order Transient Analysis 4
SPE 321 Small Group and Team Communication 3
PSY 201 Psychology 3
WRI 227 Technical Report Writing 3
Total 17

Junior Year  Fall
CST 315 Embedded Sensor Interfacing and I/O 4
CST 337 Embedded System Architecture 4
CST 371 Embedded Systems Development I 4
PHY 221 General Physics with Calculus 4
Total 16

Junior Year  Winter
CST 345 Hardware/Software Co-Design 4
CST 372 Embedded Systems Development II 3
PHY 222 General Physics with Calculus 4
MATH 465 Mathematical Statistics 4
Total 15

Junior Year  Spring
CST 334 Project Proposal 1
CST 347 Real-Time Embedded Operating Systems 4
CST 373 Embedded Systems Development III 2
WRI 350 Documentation Development Laboratory Science elective 4
Total 14

Senior Year  Fall
CST 412 Senior Development Project 3
CST 455 System On a Chip Design 4
BUS 304 Engineering Management 3
Humanities elective 3
Social Science elective 3
Total 16

Senior Year  Winter
CST 422 Senior Development Project 3
CST 417 Embedded Networking 4
CST 456 Embedded System Testing 4
MGT 345 Engineering Economy 3
Humanities elective 3
Total 17

Senior Year  Spring
CST 432 Senior Development Project 2
CST 466 Embedded System Security 3
PSY 347 Organizational Behavior 3
CSET Technical elective 3
Humanities elective 3
Total 14

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.

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 OIT.

Career Opportunities
Bachelor of Science in Software Engineering Technology degree graduates find employment as software engineers, systems engineers, systems analysts, programmer/analysts, researchers and assistants, consultants, customer engineers, etc., responsible for the application, design, development, and implementation of software in all areas of industry, government and education.

Software engineering technologists’ career paths will be many and varied. They may concentrate on hardware-support activities such as new design/development, testing, customer service and the like. They may concentrate on software specification, design, construction and testing through implementation and maintenance.

Graduates may get involved with administrative or project management by beginning as a member of an applications development team and progressing into management. They may pursue careers in product develop-
ment, marketing, sales, design, and support. Students completing the requirements for the Associate of Engineering degree should consider themselves as entry-level trainees in the careers mentioned.

High School Preparation
Coursework in computer science, mathematics, and physical science will aid students in their progress in this program.

Software Engineering Bachelor’s Program Curriculum Mission and Objectives

The mission of the Software Engineering Technology (SET) Degree Program within the Computer Systems Engineering Technology (CSET) Department at Oregon Institute of Technology is to prepare 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 students, high-technology industry and the citizens of Oregon. 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 graduates.
- To enable students to create, develop, apply and disseminate knowledge within the software development environment.
- To expose students to cross-disciplinary educational programs.
- To provide government and high tech industry employers with graduates in software engineering and related professions.

To fulfill its mission, the SET Program has the following objectives:

1. Graduates of the Software Engineering Technology (SET) Program will have a thorough understanding of the key principles and practices of applied software engineering, including possessing the ability to identify, analyze, test and solve non-trivial software engineering technical problems.
2. Graduates of the SET Bachelor’s Programs will possess a firm foundation in the scientific, mathematical and engineering principles that support the computing discipline of software engineering technology.
3. Graduates of the SET Bachelor’s Program will have developed a broad base of skills preparing them to function as a software practitioner. They will practice with ethical and professional responsibility; recognize the need for, and have the ability to engage in, continual lifelong learning as it pertains to advances in technology; and have the ability to function and communicate effectively and successfully, both individually and within multi-disciplinary teams.

Graduates of the SET Program will have the means necessary to acquire practical and analytical skills for employment within a technical environment.

Software Engineering Associate Program Mission and Objectives

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 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 students, high-technology industry, and the citizens of Oregon. 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 Objectives

To fulfill its mission, the SET Associate Program has the following objectives:

1. Graduates of the Software Engineering Technology (SET) associate program will have a thorough understanding of the key principles and practices of computer programming. (Mission 1 and 3)
2. Graduates of the SET associate program will have developed a broad base of skills preparing them to function as an entry level computer programmer. They will practice with ethical and professional responsibility; recognize the need for, and have the ability to engage in, continual life-long learning as it pertains to advances in programming; and have the ability to function and communicate effectively and successfully. (Mission 1 and 3)
3. Graduates of SET associate program will have the means necessary to acquire practical skills for employment within a technical environment. (Mission 2)

Cooperative Field Experience

The cooperative program includes work experience usually during the junior and senior years. The co-op period would be 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 cooperating employer. A student must be ready to enter the sophomore year in Software Engineering Technology to be considered for this program.

Accreditation

The Bachelor of Science in Software Engineering Technology Program is accredited by the Technology Accreditation Commission (TAC) of the Accreditation Board for Engineering and Technology (ABET), 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.
### Degree Requirements

**Associate of Engineering Technology** degree students must complete 98 credit hours as prescribed by the curriculum outline. The **Bachelor of Science in Software Engineering Technology** degree requires 186 credit hours as prescribed by the curriculum outline.

### Bachelor of Science in Software Engineering Technology

#### Curriculum

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

<table>
<thead>
<tr>
<th>Term</th>
<th>Fall</th>
<th>Winter</th>
<th>Spring</th>
<th>Summer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Freshman Year</td>
<td>CST 103: Introduction to Computer Systems I 2</td>
<td>CST 116: C++ Programming I 4</td>
<td>CST 130: Computer Organization 3</td>
<td>MATH 112: Trigonometry 4</td>
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<td>WRI 121: English Composition 3</td>
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<td></td>
<td>CST 126: Computer Architecture 3</td>
<td>MATH 251: Differential Calculus 4</td>
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<tr>
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<td>CST 240: Unix 3</td>
<td>CST 267: Software Design Patterns 3</td>
<td>MATH 254N: Vector Calculus I 4</td>
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<td>CST 267: Software Design Patterns 3</td>
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**Required courses and recommended terms during which they should be taken:**

- **During which they should be taken:**
  - Required courses and recommended terms
  - **Terms:**
    - Fall
    - Winter
    - Spring
    - Summer
  - **Credit Hours:**
    - 15
    - 16
    - 17
    - 18

**Remarks:**

- Math-based General Physics
- PHY 201, PHY 202, PHY 203, may be substituted with advisor consent.
- Must choose from the following technical electives:
  - CST 311 Advanced Data Structure and Algorithm Analysis
  - CST 328 Computer Graphics
  - CST 338 Computer Modeling and Simulation
  - CST 340 Advanced UNIX
  - CST 390 Co-op Field Practice
  - CST 407 Seminar
  - CST 418 Data Communications and Networks
  - CST 425 Advanced Networks and Telecommunications
  - CST 426 Introduction to Artificial Intelligence
  - CST 436 Robotics
  - CST 442 Application Directed Architecture
  - CST 462 Advanced Operating Systems
  - CST 490 Co-op Field Practice
  - MATH 254N: Vector Calculus I
  - MATH 321 Applied Differential Equations
  - MATH 322 Applied Differential Equations II
  - MATH 451 Numerical Methods I.

**Associate of Engineering in Software Engineering Technology**

### Curriculum

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

<table>
<thead>
<tr>
<th>Term</th>
<th>Fall</th>
<th>Winter</th>
<th>Spring</th>
<th>Summer</th>
</tr>
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<tbody>
<tr>
<td>Freshman Year</td>
<td>CST 103: Introduction to Computer Systems I 2</td>
<td>CST 116: C++ Programming I 4</td>
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<td></td>
<td>SPE 111: Fundamentals of Speech 3</td>
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<td>Sophomore Year</td>
<td>CST 116: C++ Programming II 4</td>
<td>CST 131: Computer Architecture 3</td>
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<td>MATH 251: Differential Calculus 4</td>
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<td>CST 136: Object-Oriented Programming with C++ 4</td>
<td>CST 223: Concepts of Programming Languages 3</td>
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<td>CST 250: Computer Assembly Language 4</td>
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<tr>
<td>Junior Year</td>
<td>CST 211: Data Structures 4</td>
<td>CST 240: Unix 3</td>
<td>CST 267: Software Design Patterns 3</td>
<td>MATH 254N: Vector Calculus I 4</td>
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<td>Sophomore Year</td>
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<td>CST 267: Software Design Patterns 3</td>
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<tr>
<td>Junior Year</td>
<td>CST 238: Graphical User Interface Programming 4</td>
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</table>

### Remarks

- See your adviser for acceptable elective classes
Dental Hygiene Department

Jill Schultz, Interim Department Chair

Professor: J. Schultz

Associate Professor: T. Armstrong, J. Cope

Assistant Professors: C. Devens, P. Gates, S. Hopper, V. Points

Instructors: H. Denton, E. Gordon

Degrees Offered
Bachelor of Science in Dental Hygiene
Associate of Applied Science in Dental Hygiene (La Grande)

The Dental Hygiene Programs prepare students for entry into the dental hygiene profession. Upon successful completion of the program, the graduate is eligible to apply for examination and state licensure.

Accreditation
The dental hygiene curriculum is fully accredited by the American Dental Association Commission on Dental Accreditation, a specialized accrediting board recognized by the Council for Higher Education and/or the Secretary of the U.S. Department of Education. The program is recognized by the Oregon Board of Dentistry, Oregon Dental Association and the Oregon Dental Hygiene Association.

Program Purpose
The purpose of each program is to prepare the student for entry into the profession as a clinical dental hygienist. The Bachelor of Science Program explores expanded careers in dental hygiene in the areas of public health, research, education and administration. The bachelor degree graduate will be prepared for entry into master degree programs in dental hygiene and other related programs.

Career Opportunities
Dental hygienists are most commonly employed in private dental offices but may provide oral health care services in hospitals, nursing homes and schools. A bachelor’s degree provides additional preparation for career options such as research, public health, education, or administration. Employment opportunities exist abroad with governmental agencies, companies or in private practice.

Student Preparation
A science background is beneficial to those entering any health sciences profession. It is recommended that the student considering a career in dental hygiene 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 (freshman year). A limited number of seats are available in the professional courses (sophomore, junior, and senior years). Students are selected to enter the professional courses through an application process. Students who meet the required criteria may submit an application for admission directly to the Dental Hygiene Program.

The application deadline is April 1 of the calendar year of enrollment. To be eligible for admission into the Dental Hygiene Department the following minimum eligibility requirements must be met:

1. Applicants must have on file with the OIT Office of Admissions an official Application for Admission to OIT, accompanied by a $50 non-refundable fee and official transcripts of each college or university attended. Admission to OIT is independent of admission to the Dental Hygiene Program. All applicants to OIT are admitted as pre-dental hygiene majors until acceptance into the dental hygiene program.

2. Applicants must have successfully completed or be in progress of completing all freshmen pre-dental hygiene courses. Completion of Introduction to Dental Hygiene (DH 100 and DH 101 on campus or DHE 100 online) is required by the end of spring term. All other prerequisite (freshman) courses must be completed by the end of summer term.

3. Applicants must have a minimum cumulative 2.50 GPA in previous college work.

4. Applicants must submit a Dental Hygiene Application for Admission, related forms and $50 non-refundable application fee directly to the Dental Hygiene Department by April 1 of the calendar year of enrollment. Detailed information and forms can be found on the OIT Dental Hygiene Program web page.

Program Requirements
All students admitted to the Dental Hygiene Program will be required to purchase a specific laptop computer designated by the Dental Hygiene Department. The Department also requires students to purchase instruments for use in the program.

Bachelor of Science in Dental Hygiene

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

Pre-Dental Hygiene

| Freshman Year  |  |  |
|----------------|------------------|
| Fall  |  |  |
| BIO 200  | Medical Terminology  | 2  |
| BIO 231  | Human Anatomy and Physiology I  | 4  |
| CHE 101  | Elementary Chemistry  | 3  |
| CHE 104  | Elementary Chemistry Laboratory  | 1  |
| DH 100  | Introduction to Dental Hygiene I  | 1  |
| MATH 111  | College Algebra  | 4  |
| Total  |  | 15  |

| Freshman Year  |  |  |
|----------------|------------------|
| Winter  |  |  |
| BIO 105  | Microbiology  | 4  |
| BIO 232  | Human Anatomy and Physiology II  | 4  |
| CHE 102  | Elementary Chemistry  | 3  |
| CHE 105  | Elementary Chemistry Laboratory  | 1  |
| DH 101  | Introduction to Dental Hygiene II  | 1  |
| WRI 121  | English Composition  | 3  |
| Total  |  | 16  |

| Freshman Year  |  |  |
|----------------|------------------|
| Spring  |  |  |
| BIO 233  | Human Anatomy and Physiology III  | 4  |
| CHE 103  | Elementary Chemistry  | 3  |
| CHE 106  | Elementary Chemistry Laboratory  | 1  |
| SOC 204  | Introduction to Sociology  | 3  |
| SPE 111  | Fundamentals of Speech  | 3  |
| WRI 122  | English Composition  | 3  |
| Total  |  | 17  |
### Professional Courses

<table>
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<th>Spring</th>
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<tr>
<td>DH 221</td>
<td>Dental Hygiene Clinical Practice and Seminar I</td>
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<tr>
<td>DH 226</td>
<td>Head and Neck Anatomy</td>
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<tr>
<td>DH 240</td>
<td>Prevention I</td>
<td>3</td>
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<tr>
<td>DH 275</td>
<td>Dental Ethics</td>
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<tr>
<td>CHE 210</td>
<td>Clinical Pharmacology</td>
<td>3</td>
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<td>SPE 321</td>
<td>Small Group and Team Communication</td>
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<td>DH 222</td>
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<td>DH 237</td>
<td>Oral Histology and Embryology</td>
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</tr>
<tr>
<td>DH 241</td>
<td>Prevention II</td>
<td>3</td>
</tr>
<tr>
<td>DH 244</td>
<td>General and Oral Pathology</td>
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<td>DH 252</td>
<td>Oral Radiology I</td>
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<tr>
<td>DH 366</td>
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<td>BUS 317</td>
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<td>DH 340</td>
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<td>DH 354</td>
<td>Periodontology</td>
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<td>DH 381</td>
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<td>PSTY 301</td>
<td>Basic Counseling Techniques</td>
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<td>DH 341</td>
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<td>DH 351</td>
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<td>DH 382</td>
<td>Community Dental Health III</td>
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<td>WRI 227</td>
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<td>DH 344</td>
<td>Advanced General and Oral Pathology</td>
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<td>DH 363</td>
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<td>International Externship (optional)</td>
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<td>DH 383</td>
<td>Community Dental Health IV</td>
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### Associate of Applied Science in Dental Hygiene

#### Curriculum

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

#### Pre-Dental Hygiene

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<thead>
<tr>
<th>Freshman Year</th>
<th>Fall</th>
<th>Winter</th>
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<tbody>
<tr>
<td>BIO 200</td>
<td>Medical Terminology</td>
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<td>BIO 231</td>
<td>Human Anatomy and Physiology</td>
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<tr>
<td>CHE 101</td>
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<td>CHE 104</td>
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<tr>
<td>DHE 100</td>
<td>Introduction to Dental Hygiene</td>
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<td>MATH 105</td>
<td>Collegiate Mathematics</td>
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<td>BIO 205</td>
<td>Nutrition</td>
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#### Professional Courses

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<td>CHE 210</td>
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<td>Principles of Dental Hygiene I</td>
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<td>Medical and Dental Emergency Procedures</td>
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<th>Sophomore Year</th>
<th>Winter</th>
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<tbody>
<tr>
<td>DHE 212</td>
<td>Principles of Dental Hygiene II</td>
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<td>DHE 222</td>
<td>Dental Hygiene Clinical Practice II</td>
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<td>DHE 227</td>
<td>General Pathology</td>
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<td>DHE 253</td>
<td>Oral Radiology II</td>
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<td>DHE 275</td>
<td>Dental Ethics</td>
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<td>DHE 282</td>
<td>Medical and Dental Emergency Procedures</td>
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<td>DHE 223</td>
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<td>DHE 233</td>
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<td>DHE 261</td>
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<td>DHE 273</td>
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### 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, 195; Associate of Applied Science, 154.

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 professional courses (DH and DHE), communication courses, counseling (PSY) and clinical pharmacology (CHE 210) to continue in the program.
Junior Year | Summer
--- | ---
DHE 311 | Principles of Dental Hygiene IV 3
DHE 321 | Dental Hygiene Clinical Practice IV 4
DHE 333 | Periodontal Therapy 3
DHE 351 | Dental Analgesia 3
DHE 380 | Oral Health Planning and Care I 3
**Total** | **16**

Junior Year | Fall
--- | ---
DHE 312 | Principles of Dental Hygiene V 3
DHE 320 | Dental Materials and Chairside Assisting 3
DHE 322 | Dental Hygiene Clinical Practice V 4
DHE 381 | Oral Health Planning and Care II 3
Psychology elective | 4
**Total** | **17**

Junior Year | Winter
--- | ---
DHE 313 | Principles of Dental Hygiene VI 4
DHE 323 | Dental Hygiene Clinical Practice VI 5
WRI 227 | Technical Report Writing 3
Humanities elective | 3
Psychology elective | 3
**Total** | **18**

Bachelor's Degree Completion Outreach Program

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 may be completed at OIT or through an online, Web-based distance-learning program.

To apply, go to www.oit.edu/dist, print the Admissions Application and Check Sheet, and submit all required information to the Distance Education Office.

To the bachelor's degree completion program.

Additional required courses (Transfer or OIT)

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<thead>
<tr>
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<tbody>
<tr>
<td>BIOS 101</td>
<td>Microbiology 4</td>
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<tr>
<td>BIO 231</td>
<td>Anatomy and Physiology I 4</td>
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<tr>
<td>BIO 232</td>
<td>Anatomy and Physiology II 4</td>
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<td>BIO 233</td>
<td>Anatomy and Physiology III 4</td>
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<td>CHE 101/104</td>
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<td>CHE 225</td>
<td>Fundamentals of Speech 3</td>
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<td>Introduction to Sociology 3</td>
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<td>WRI 123</td>
<td>English Composition 3</td>
</tr>
<tr>
<td>WRI 227</td>
<td>Technical Report Writing 3</td>
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</table>

* Credits may be granted for additional specialty licensure exams.

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 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 OIT.
- Maintain a grade “C” or better in all courses.

**Courses Granted for Licensure**

DH 100/101 Introduction to Dental Hygiene I, II 2
DH 226 Head and Neck Anatomy 2
DH 237 Oral Histology and Embryology 2
DH 267 Emergency Procedures 3
DH 244 General and Oral Pathology 3
DH 221/222/223 Dental Hygiene Clinical Practice and Seminar I, II, and III 11
DH 240/241/242 Prevention I, II, and III 9
DH 252/253 Oral Radiology I and II 5
DH 254 Introduction to Periodontology 1
DH 275 Dental Ethics 1
DH 321/322/323 Dental Hygiene Clinical Practice and Seminar IV, V, and VI 12
DH 340/341 Prevention IV and V 6
DH 344 Advanced General and Oral Pathology 3
DH 354 Periodontology 3
DH 363 Dental Materials 3
DH 366 Dental Anatomy 2
DH 380-383 Community Dental Health I, II, III and IV 7
DH 421/422/423 Dental Hygiene Clinical Practice and Seminar VII, VIII, IX 14

**OIT Degree Completion Courses**

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<tr>
<th>Course</th>
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<td>Personal Finance 3</td>
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<td>DH 351</td>
<td>Pain Management I* 2</td>
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<td>DH 352</td>
<td>Pain Management II* 3</td>
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<td>DH 401</td>
<td>Overview of Advanced Dental Hygiene 3</td>
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<td>Current Issues in Dental Hygiene 3</td>
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<td>Dental Practice Management 3</td>
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<td>DH 455</td>
<td>Dental Hygiene Research 3</td>
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<td>DH 470</td>
<td>Community Program Planning 3</td>
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<td>MATH 243</td>
<td>Introductory Statistics 4</td>
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<td></td>
<td>Social Science elective 3</td>
</tr>
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<td></td>
<td>Elective approved by adviser 3</td>
</tr>
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</table>
Electrical Engineering and Renewable Energy Department

Mateo Aboy, Department Chair
Cristina Crespo, Program Director, Electronics Engineering Technology in Portland
Robert Bass, Program Director, Renewable Energy Engineering in Portland
Jamie Zipay, Program Director, Electrical Engineering and Renewable Energy Engineering in Klamath Falls

Associate Professors: M. Aboy, P. Dingman, M. Timmerman, J. Zipay
Assistant Professors: R. Bass, C. Crespo, T. White

Degrees Offered
Bachelor of Science in Electrical Engineering (Klamath Falls Campus)
Bachelor of Science in Electronics Engineering Technology (Portland Campus)
Bachelor of Science in Renewable Energy Engineering (Klamath Falls and Portland campuses)

Electrical Engineering

Degree Offered
A Bachelor of Science in Electrical Engineering, BSEE, degree is awarded by OIT’s Klamath Falls campus. A conventional four-year daytime delivery program is offered in Klamath Falls.

Career Opportunities
There are more electrical engineers in the world than any other type of engineer. This means that there are more jobs for electrical engineers than any other type of engineer. Consider the wide range of items that are produced by electrical and electronics engineers, including computers, digital cameras, cell phones, iPods, TVs, stereos, global positioning sensors, laser range finders, microwave ovens, night-vision sensors, electronic fuel injection, avionics, robotics, biomedical instruments, wireless telecommunications, and much more. An electrical engineer designs, builds, analyzes, tests, integrates, markets, and field services all of these products.

Electrical engineering at OIT is concerned with theory, concepts, and practices of applied electrical and electronics engineering. Emphasis is placed on the practical application of engineering knowledge. As a result, the electrical engineering graduate possesses a combination of theoretical and practical understanding and requires minimal on-the-job training. The OIT BSEE graduate is also well prepared to attend graduate school. Graduates of the Electrical Engineering Program fulfill a wide range of functions within industry. Bachelor degree graduates are currently placed in positions such as component and system design, field engineering, manufacturing engineering, sales or market engineering, test engineering, and quality control engineering.

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, semiconductor companies, and automated electronic-controlled processing companies.

Objectives
The objectives of the Electrical Engineering Program are:
1. To provide graduates that possess the engineering design and laboratory skills needed in careers within broad-based electrical, electronics, computer, semiconductor, optoelectronic, renewable energy and biomedical fields.
2. To provide graduates that are technically competent for careers in the field of electrical engineering. They will have the ability to solve engineering problems in new and emerging disciplines by applying principles of mathematics, science and engineering.
3. To provide graduates that possess the analytical skills, written and oral communication skills, critical thinking and problem-solving abilities so that they may enjoy both vertical and horizontal career mobility in engineering fields.
4. To provide graduates that appreciate the need of continuing education in electrical engineering, optoelectronics, biomedical engineering, and related disciplines after graduation and have an awareness of professional and ethical responsibilities of their career disciplines

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. Those community college students completing the electrical engineering transfer program should receive full credit for the first two years of EE courses.

Those students with an Associate Degree in Electronics Engineering Technology will most likely have to take two or more “bridging” courses and EE 225 (Circuits III-LaPlace Transforms and Applications) in order to have all the lower-division requirements of the EE Program completed.

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.
Degree Requirements
A rigorous curriculum in Electrical Engineering requires 184 term hours of credit, taking approximately four years to complete. Students in the EE Program must earn a grade of "C" or better in all EE courses that are prerequisites for another EE course.

Bachelor of Science in Electrical Engineering

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

Freshman Year  Fall
CHE 201  General Chemistry  3
CHE 204  General Chemistry Laboratory  1
EE 101  Introduction to Engineering I  4
MATH 251  Differential Calculus  4
WRI 121  English Composition  3
Total  12

Freshman Year  Winter
EE 102  Introduction to Engineering II  1
EE 131  Digital Electronics I – Combinational Logic  4
MATH 252  Integral Calculus  4
PHY 221  General Physics with Calculus  4
WRI 122  English Composition  3
Total  16

Sophomore Year  Fall
CST 116  C++ Programming I  4
EE 221  Circuits I – DC and 1st Order Transient Analysis  4
PHY 223  General Physics with Calculus  4
SPE 111  Fundamentals of Speech  3
Total  15

Sophomore Year  Winter
EE 223  Circuits II – AC and 2nd Order Transient Analysis  4
MATH 321  Applied Differential Equations I  3
MATH 341  Linear Algebra I  3
SPE 111  Fundamentals of Speech  3
Total  16

Sophomore Year  Spring
EE 225  Circuits III – LaPlace Transforms and Applications  4
MATH 253N  Sequences and Series  4
WRI 227  Technical Report Writing  3
Total  17

Junior Year  Fall
EE 321  Electronics I – Introduction to Amplifiers and Semiconductor Devices  5
EE 331  Digital System Design with HDL  4
EE 341  Electricity and Magnetism with Transmission Lines  4
MGT 345  Engineering Economy  3
Total  16

Junior Year  Winter
EE 323  Electronics II – Transistor Amplifiers and Analog ICs  5
EE 333  Microcontroller Engineering  4
EE 343  Solid-State Electronic Devices  3
Engineering elective *  4
Total  16

Senior Year  Fall
EE 411  Senior Project I  2
EE 431  Digital Signal Processing  3
SPE 321  Small Group and Team Communication  3
WRI 321  Advanced Technical Communication  1
Engineering elective *  4
Total  17

Senior Year  Winter
EE 412  Senior Project II  2
EE 421  Analog Integrated-Circuit Design  5
MATH 465  Mathematical Statistics  4
WRI 321  Advanced Technical Communication  1
Math/Science elective*  4
Total  16

Senior Year  Spring
EE 401  Communication Systems  5
EE 413  Senior Project III  2
WRI 323  Advanced Technical Communication  1
Social Science elective  3
Humaneities elective  3
Total  14

* Requires adviser approval

NOTE: All physics, chemistry and nearly all electrical engineering courses have an associated laboratory component. See detailed course descriptions in this catalog.

Electronics Engineering Electives for Specific Emphases within BSEE Curriculum
Students may choose from the following list for their 12 credits of engineering elective courses in a specific emphasis. Transfer students may use other courses to satisfy an engineering elective. All engineering electives require the approval of a student’s academic adviser. All courses may not be offered every year.

Renewable Energy Emphasis
Approved REE courses. (existing courses)  12

General EE Electives
EE 419  Power Electronics  4
EE 423  CMOS Digital Integrated-Circuit Design  4
EE 425  Wireless Communication  4
EE 456  Control System Design  3

Electronics Engineering Technology

Degrees Offered
Bachelor of Science in Electronics Engineering Technology (Portland Campus)

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.

Oregon Institute of Technology’s ABET accredited Bachelor of Science degree in Electronics Engineering Technology is conveniently offered at the OIT-Portland West Campus in order to accommodate degree-seeking professionals working for high-tech companies. The West Campus is located at the heart of the high-tech industry cluster (Silicon Forest), minutes away from companies such as Intel, Tektronix, MAXIM, Credence, Lattice, Synopsis, TriQuint, and ESI. Some of the core courses for the degree and technical electives are also available online and at the OIT-Portland East campus.

Career Opportunities
The program is designed to prepare graduates to assume engineering and technology positions in the electronics industry. Graduates of the Electronics Engineering Technology Program fulfill a wide range of functions within industry. Bachelor’s degree graduates are currently placed in positions such as component and system design, test
engineering, product engineering, field engineering, manufacturing engineering, sales or market engineering, and quality control engineering. 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, TriQuint, MSE and Intel.

Objectives
The objectives of the Electronics Engineering Technology Program are:

1. Graduates will be technically competent for immediate employment in the field of electronics. This includes having the ability to solve engineering and technology problems by applying principles of mathematics, science and engineering.
2. Graduates will be able to use modern engineering techniques and tools to identify, formulate, and solve electronics engineering technology problems.
3. Graduates will have analytical, communication, problem solving, and critical thinking skills to function effectively as members of multidisciplinary teams and as contributors to the technology workforce.
4. Graduates will demonstrate an understanding of ethical, societal, and professional responsibility, and will have an appreciation of the need for life-long learning.

Student Preparation
OIT’s Portland campus offers a degree program designed to accommodate working professionals with evening delivery of upper-division and custom bridging courses. It is especially suited for working professional's with an associate degree in Electronics Engineering Technology, Microelectronics Technology, or equivalent coursework.

Students entering the B.S. degree in Electronics Engineering Technology program by transfer are requested to contact the EET Program Director concerning transfer of technical coursework.

An accredited Associate of Applied Science (AAS) degree in Electronics or Microelectronics and Calculus-level math is a perfect preparation to start upper-division coursework. Alternatively, coursework in DC Circuit Analysis, AC Circuit Analysis, Combinational Logic (Digital Circuits), Sequential Logic (Digital Circuits), Semiconductor Devices, and other technical and general education courses provides adequate preparation.

The BSEET program has articulation agreements with the Electronics and Microelectronics programs at Portland Community College, Clackamas Community College, and Chemeketa Community College. It is recommended that students start the advising process with OIT right after they complete the first year of their AAS degree.

Accreditation
The Electronics Engineering Technology program is accredited by the Technology Accreditation Commission (TAC) of the Accreditation Board for Engineering and Technology (ABET), 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.

Degree Requirements
A rigorous curriculum in Electronics Engineering Technology requires 186 credit hours, taking a full-time student approximately four years to complete.

Bachelor of Science in Electronics Engineering Technology

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 EET program director for a customized curriculum tailored to their individual circumstances. Students with an accredited AAS degree in Electronics Engineering Technology should receive credit for all or most of the first two years. Some bridging courses may be required.

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, or equivalent coursework. These programs or preparative coursework should include coursework in:

Electronics and Technology Courses*
- DC Circuit Analysis
- AC Circuit Analysis
- Digital Circuits: Combinational Logic
- Digital Circuits: Sequential Logic
- Semiconductor and Transistors
- Sophomore-level Technical Electives
- C++ Programming

Mathematics and Physics *
- Differential Calculus
- Integral Calculus
- Calculus-Based Physics

Communications, Humanities and Social Science
- Communications: SPE 111, WRI 121, WRI 122, WRI 227 *
- Humanities and Social Science Electives *
* Note: Some of this coursework can also be completed at the OIT-Portland campus (e.g. Calculus, Physics, Electronics, WRI 227, and Gen Ed).

### Option 1: Starting with Analog Electronics, DSP and Communications

**Required Time:** 2.5 years (upper-division)

This option is intended for transfer students who have completed the lower-division requirements through an AAS degree or equivalent coursework and are interested in completing the upper-division requirements for BSEET degree in 2.5 additional years starting with the Analog Electronics sequence and the Circuits, Systems, DSP and Communications sequence. This option starts in summer term with Differential Equations and LabVIEW programming.

<table>
<thead>
<tr>
<th>Year</th>
<th>Junior Year</th>
<th>Summer</th>
<th>Subject</th>
<th>Credits</th>
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<td>EE 236</td>
<td>LabVIEW Programming</td>
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<td>MATH 321</td>
<td>Applied Differential Equations I</td>
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<td>Electronics I - Introduction to Amplifiers and Semiconductor Devices</td>
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<td>EET 371</td>
<td>LaPlace Transforms and Applications</td>
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<td>EET 373</td>
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<td>Operational Amplifiers and Applications</td>
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<td>EET 472</td>
<td>Communication Systems</td>
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<td>Digital Systems I</td>
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<td>MGT 345</td>
<td>Engineering Economy</td>
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<td>Digital Systems II</td>
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<td>EET 363</td>
<td>Introduction to Microcontrollers</td>
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</table>

### Option 2: Starting Digital Systems and Microcontrollers

**Required Time:** 2.5 to 3 years (upper-division)

This option is intended for transfer students who have completed the lower-division requirements through an AAS degree or equivalent coursework and are interested in completing the upper-division requirements for BSEET degree in 2.5 to 3 additional years starting with the Digital Systems and Microcontrollers sequences.

<table>
<thead>
<tr>
<th>Year</th>
<th>Junior Year</th>
<th>Fall</th>
<th>Subject</th>
<th>Credits</th>
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<tr>
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<td>EET 361</td>
<td>Digital Systems I</td>
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<td>MGT 345</td>
<td>Engineering Economy</td>
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<tr>
<td></td>
<td>EET 362</td>
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<td>Digital Systems II</td>
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<tr>
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<td>EET 363</td>
<td>Introduction to Microcontrollers</td>
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<td>MGT 345</td>
<td>Engineering Economy</td>
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<td>SPE 321</td>
<td>Small Group and Team Communication</td>
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### Year 3

**Completion of the senior project**

<table>
<thead>
<tr>
<th>Year</th>
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<td>EET 458</td>
<td>Senior Project: Individual Project Design</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>EET 358</td>
<td>Senior Project: Individual Project Proposal</td>
<td>2</td>
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<tr>
<td></td>
<td>SPE 321</td>
<td>Small Group and Team Communication</td>
<td>3</td>
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<tr>
<td></td>
<td></td>
<td>Total</td>
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</tbody>
</table>

### Renewable Energy Engineering

#### Degree Offered

Bachelor of Science in Renewable Energy Engineering

A Bachelor of Science in Renewable Energy Engineering, BSREE, is offered by both Oregon Institute of Technology's Portland and Klamath Falls campuses. A program that accommodates both full-time and part-time students is offered at the Portland East Campus (for more information, contact Dr. Robert Bass, 7726 SE Harmony Road, Portland, OR 97222, phone (503) 821-1253). A conventional four-year, day-time delivery program is offered at the main campus in Klamath Falls (for more information, contact Prof. James Zipay, 3201 Campus Drive, Klamath Falls, OR 97601, phone (541) 885-1543). For information on beginning the Renewable Energy Engineering Program or when transferring from another college or
The Renewable Energy Engineering Degree Program prepares students for the challenges of designing, promoting and implementing renewable energy engineering in society’s 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 tradition resources, societies have been forced to re-think and re-develop their energy infrastructures. Renewable energy resources include solar thermal collectors, photovoltaics, ground-source heat pumps, geothermal resources, hydroelectric power, wind power, tidal and wave power, biofuels and fuel cells. OIT’s Bachelor of Science in Renewable Energy Engineering prepares students for success in these rapidly developing fields.

The Renewable Energy Engineering Degree 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.

The program is delivered in both Portland and Klamath Falls. In Portland, general education courses are provided by local community colleges while engineering course work is delivered by Oregon Tech at the Portland Campuses. In Klamath Falls all necessary courses are available at OIT’s main campus.

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 hydronics engineers, design and modeling engineers for net-zero energy buildings, LEED accredited professionals (AP), 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.

Program Educational Objectives
1. Establish a firm understanding of the fundamentals of energy, based on the concepts of science and mathematics, such that graduates excel as professionals in the various fields of energy engineering.
2. Provide open-ended engineering problems, practical working examples and opportunities for applied senior projects via partnerships with industry and other institutions such that graduates become creative, independent leaders who are ready for immediate employment.
3. Convey the importance of becoming life-long learners and responsible citizens who think critically, communicate effectively and are aware of professional and ethical responsibilities in implementing sustainable engineering solutions.

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.

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.

Degree Requirements
The Bachelor of Science in Renewable Energy Engineering is a rigorous curriculum that requires 181 credit hours and approximately four years to complete. See the general education requirements for a bachelor’s degree listed in the Academic Policies section of the catalog.

Bachelor of Science in Renewable Energy Engineering

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

<table>
<thead>
<tr>
<th>Freshman Year</th>
<th>Fall</th>
<th>Winter</th>
<th>Spring</th>
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<tbody>
<tr>
<td>CHE 201</td>
<td>General Chemistry</td>
<td>CHE 202</td>
<td>CHE 205</td>
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<tr>
<td>CHE 204</td>
<td>General Chemistry Laboratory</td>
<td>ENGR 266</td>
<td>MATH 252</td>
<td>14</td>
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<td>MATH 251</td>
<td>Differential Calculus</td>
<td>General Chemistry</td>
<td>Computer Programming for Engineers</td>
<td></td>
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<tr>
<td>SPE 111</td>
<td>Fundamentals of Speech</td>
<td>CHE 205</td>
<td>MATH 252</td>
<td>3</td>
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<tr>
<td>WRI 121</td>
<td>English Composition</td>
<td>English Composition</td>
<td>Integral Calculus</td>
<td></td>
</tr>
<tr>
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<table>
<thead>
<tr>
<th>Sophomore Year</th>
<th>Fall</th>
<th>Winter</th>
<th>Spring</th>
<th>Total</th>
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</thead>
<tbody>
<tr>
<td>EE 221</td>
<td>Circuits 1 - DC and 1st Order</td>
<td>PHY 221</td>
<td>MATH 321</td>
<td>14</td>
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<tr>
<td></td>
<td>Transient Analysis</td>
<td>General Physics with Calculus</td>
<td>Applied Differential Equations I</td>
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<td></td>
<td></td>
<td></td>
<td>Social Science elective</td>
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Total 14
Social Science elective 3
MATH 321  Applied Differential Equations I 3
PHY 221  General Physics with Calculus 4
MATH 254N  Vector Calculus I 4
CHE 201  General Chemistry 3
CHE 202  General Chemistry 3
CHE 205  General Chemistry Laboratory 1
ENGR 266  Computer Programming for Engineers 3
MATH 252  Integral Calculus 4
WRI 122  English Composition 3
Total 14

Social Science elective 3
WRI 121  English Composition 3
MATH 252  Integral Calculus 4
WRI 122  English Composition 3
Total 14

Total 14
SPE 111  Fundamentals of Speech 3
CHE 202  General Chemistry 3
CHE 205  General Chemistry Laboratory 1
ENGR 266  Computer Programming for Engineers 3
MATH 252  Integral Calculus 4
WRI 122  English Composition 3
Total 14

Total 14
CHE 260  Electrochemistry for Renewable Energy Applications 4
MATH 254N Vector Calculus I 4
REE 201*  Introduction to Renewable Energy 3
WRI 227  Technical Report Writing 3
Social Science elective 3
Total 17

Total 14
Physics 1 and 2 4
MATH 252  Integral Calculus 4
WRI 122  English Composition 3
Total 14

Total 14
CHE 201  General Chemistry 3
CHE 202  General Chemistry 3
CHE 205  General Chemistry Laboratory 1
ENGR 266  Computer Programming for Engineers 3
MATH 252  Integral Calculus 4
WRI 122  English Composition 3
Total 14

Total 14
CHE 260  Electrochemistry for Renewable Energy Applications 4
MATH 254N Vector Calculus I 4
REE 201*  Introduction to Renewable Energy 3
WRI 227  Technical Report Writing 3
Social Science elective 3
Total 17

Total 14
Physics 1 and 2 4
MATH 252  Integral Calculus 4
WRI 122  English Composition 3
Total 14

Total 14
CHE 201  General Chemistry 3
CHE 202  General Chemistry 3
CHE 205  General Chemistry Laboratory 1
ENGR 266  Computer Programming for Engineers 3
MATH 252  Integral Calculus 4
WRI 122  English Composition 3
Total 14

Total 14
CHE 260  Electrochemistry for Renewable Energy Applications 4
MATH 254N Vector Calculus I 4
REE 201*  Introduction to Renewable Energy 3
WRI 227  Technical Report Writing 3
Social Science elective 3
Total 17

Total 14
Physics 1 and 2 4
MATH 252  Integral Calculus 4
WRI 122  English Composition 3
Total 14

Total 14
CHE 201  General Chemistry 3
CHE 202  General Chemistry 3
CHE 205  General Chemistry Laboratory 1
ENGR 266  Computer Programming for Engineers 3
MATH 252  Integral Calculus 4
WRI 122  English Composition 3
Total 14

Total 14
CHE 260  Electrochemistry for Renewable Energy Applications 4
MATH 254N Vector Calculus I 4
REE 201*  Introduction to Renewable Energy 3
WRI 227  Technical Report Writing 3
Social Science elective 3
Total 17

Total 14
### Sophomore Year Winter

<table>
<thead>
<tr>
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<th>Credits</th>
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<tbody>
<tr>
<td>ECO 201N</td>
<td>Principles of Economics, Microeconomics</td>
<td></td>
</tr>
<tr>
<td>or</td>
<td>ECO 202N</td>
<td>Principles of Economics, Macroeconomics</td>
</tr>
<tr>
<td>EE 223</td>
<td>Circuits II - AC and 2nd Order Transient Analysis</td>
<td>4</td>
</tr>
<tr>
<td>ENGR 211</td>
<td>Statics</td>
<td>4</td>
</tr>
<tr>
<td>PHY 222</td>
<td>General Physics with Calculus</td>
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### Sophomore Year Spring

<table>
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<tr>
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<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>EE 225</td>
<td>Circuits III - Laplace Transforms and Applications</td>
<td>4</td>
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<tr>
<td>PHY 223</td>
<td>General Physics with Calculus</td>
<td>4</td>
</tr>
<tr>
<td>REE 243</td>
<td>Electrical Power</td>
<td>4</td>
</tr>
<tr>
<td>REE 253</td>
<td>Electromechanical Energy Conversion</td>
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<tr>
<td><strong>Total</strong></td>
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### Junior Year Fall

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<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>EE 321</td>
<td>Electronics I - Introduction to Amplifiers and Semiconductor Devices</td>
<td>5</td>
</tr>
<tr>
<td>MECH 318</td>
<td>Fluid Mechanics I</td>
<td>4</td>
</tr>
<tr>
<td>REE 331</td>
<td>Fuel Cells</td>
<td>3</td>
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<tr>
<td><strong>Total</strong></td>
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### Junior Year Winter

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<thead>
<tr>
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<tbody>
<tr>
<td>ENGR 355</td>
<td>Thermodynamics</td>
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<tr>
<td>MATH 361</td>
<td>Statistical Methods I</td>
<td>4</td>
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<tr>
<td>WRI 327</td>
<td>Advanced Technical Writing</td>
<td>3</td>
</tr>
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<td><strong>Total</strong></td>
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### Junior Year Spring

<table>
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<tbody>
<tr>
<td>EE 419</td>
<td>Power Electronics</td>
<td>4</td>
</tr>
<tr>
<td>MECH 323</td>
<td>Heat Transfer I</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
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<td><strong>16</strong></td>
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### Senior Year Fall

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<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>EE 343</td>
<td>Solid-State Electronic Devices</td>
<td>3</td>
</tr>
<tr>
<td>MECH 433</td>
<td>HVAC</td>
<td>3</td>
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<tr>
<td>REE 339</td>
<td>Senior Project I</td>
<td>2</td>
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<tr>
<td>REE 463</td>
<td>Energy Systems Instrumentation and Control</td>
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### Senior Year Winter

<table>
<thead>
<tr>
<th>Course Code</th>
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<th>Credits</th>
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<tbody>
<tr>
<td>EE 456</td>
<td>Control System Design</td>
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<tr>
<td>REE 412</td>
<td>Photovoltaic Systems</td>
<td>3</td>
</tr>
<tr>
<td>REE 449</td>
<td>Senior Project II</td>
<td>2</td>
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<tr>
<td>SPE 321</td>
<td>Small Group and Team Communication</td>
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<td><strong>Total</strong></td>
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### Renewable Energy Engineering Electives

(all courses may not be offered every year)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>EE 347</td>
<td>Digital Logic</td>
<td>3</td>
</tr>
<tr>
<td>REE 344</td>
<td>Nuclear Energy</td>
<td>3</td>
</tr>
<tr>
<td>REE 345</td>
<td>Wind Power</td>
<td>3</td>
</tr>
<tr>
<td>REE 346</td>
<td>Biofuels and Biomass</td>
<td>3</td>
</tr>
<tr>
<td>REE 347</td>
<td>Hydroelectric Power</td>
<td>3</td>
</tr>
<tr>
<td>REE 348</td>
<td>Solar Thermal Energy Systems</td>
<td>3</td>
</tr>
<tr>
<td>REE 451</td>
<td>Geothermal Energy and Ground-Source Heat Pumps</td>
<td>3</td>
</tr>
<tr>
<td>REE 465</td>
<td>Renewable Energy Transportation Systems</td>
<td>3</td>
</tr>
</tbody>
</table>

* Klamath Falls students may take EE 101/EE 102/EE 103 in place of REE 201.

** Adviser approval required
Geomatics Department

Jack Walker, Department Chair

Professors: J. Ritter, J. Walker

Assistant Professors: E. Kalb, M. Marker

Degree Offered
Bachelor of Science in Geomatics with options in:
- Surveying
- Geographic Information Systems

Minor Offered
Geographic Information Systems

Geomatics is the modern scientific term referring to an integrated approach to the measurement, analysis and management of spatial data. Geomatics employs advanced technologies such as Geographic Information Systems (GIS), the Global Positioning System (GPS), digital photogrammetry, digital total stations, and satellite remote sensing to create a detailed but understandable picture of the Earth’s physical features and the built environment. Geomatics encompasses disciplines that depend on georeferenced spatial data, including surveying, engineering, cartography, land information management, geodesy, and remote sensing.

Students within the Geomatics Program must choose between either an option in Surveying or Geographic Information Systems (GIS). Students may, with consent of their adviser, complete both options.

Program Objectives
The bachelor in Geomatics Program options have the following objectives:
1. Provide students with a broad foundation in major geomatics disciplines.
2. Prepare students to function effectively on multidisciplinary teams.
3. Prepare graduates to enter into professional practice.
4. Prepare graduates to become licensed or certified professionals.

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. Students lacking this preparation typically require additional time for degree completion.

Degree Requirements
A minimum of 181 term hours must be completed for the Surveying option, of which 77 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.

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 sufficient 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. The program rigor is similar to a traditional engineering program; however, geomatics courses replace the traditional engineering core subjects.

Cooperative Education
Geomatics students may, upon completion of the freshman year, apply for student career experience programs (SCEP) with the U.S. Bureau of Land Management, Bonneville Power Administration, U.S. Forest Service, or other appropriate 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, with a maximum of four credits being 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
Students completing their freshman year and a summer internship with the Bureau of Land Management are eligible for scholarships varying from $1000 to $2000. SCEP students may apply for additional funding to cover books and tuition. Numerous other national and state scholarships are dedicated to geomatics students.

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. Geomatics provides the opportunity to work primarily outdoors, exclusively in an office, or in some combination of the two. Geomatics attracts individuals who enjoy working outdoors, as well as those who enjoy working indoors with computers, advanced technology, and high-tech instruments.

Accreditation
The Geomatics Program (surveying option) is accredited by the Applied Science Accreditation Commission (ASAC) of the Accreditation Board for Engineering and Technology (ABET), 111 Marketplace, 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.

**Bachelor of Science in Geomatics, Surveying Option**

**Curriculum**

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

| Freshman Year | Fall          | GME 161 | Plane Surveying I | 4 |
|               | MATH 112 Trigonometry | 4 |
|               | WRI 121 English Composition | 3 |
|               | Social Science elective | 3 |
|               | Total | 14 |

| Freshman Year | Winter       | CIV112 | Graphical Communication | 3 |
|               |              | GME 175 | Computations and Plating | 4 |
|               |              | MATH 251 | Differential Calculus | 4 |
|               |              | WRI 122 | English Composition | 3 |
|               | Total | 14 |

| Sophomore Year | Fall         | GME 134 | Geographic Information Systems | 4 |
|                |              | GME 162 | Plane Surveying II | 5 |
|                |              | MATH 252 | Integral Calculus | 4 |
|                |              | SPE 111 | Fundamentals of Speech | 3 |
|                | Total | 16 |

| Sophomore Year | Winter       | GME 242 | Land Descriptions and Cadastre | 3 |
|                |              | GME 264 | Digital Design for Surveying | 3 |
|                |              | PHY 222 | General Physics with Calculus | 4 |
|                |              | WRI 227 | Technical Report Writing | 3 |
|                |              | Social Science elective | 3 |
|                | Total | 16 |

| Sophomore Year | Spring       | GME 372 | Subdivision Planning and Plating | 4 |
|                |              | MATH 361 | Statistical Methods I | 4 |
|                |              | MIS 275 | Introduction to Relational Databases | 3 |
|                |              | PHY 223 | General Physics with Calculus | 4 |
|                | Total | 15 |

| Junior Year    | Fall         | GME 343 | Boundary Surveys | 4 |
|                | MIS 115 Visual BASIC Programming | 4 |
|                | WRI 327 Advanced Technical Writing | 3 |
|                | Science elective | 4 |
|                | Total | 15 |

| Junior Year    | Winter       | GME 466 | Boundary Law II | 3 |
|                |              | SPE 321 Small Group and Team Communication | 3 |
|                |              | GME/GIS elective | 3 |
|                |              | Math elective | 3 |
|                |              | Social Science elective | 3 |
|                | Total | 16 |

| Junior Year    | Spring       | BUS 355 | Business Law | 3 |
|                |              | GME 351 | Construction and Engineering Surveying | 4 |
|                |              | GME 444 | Adjustment by Least Squares | 4 |
|                |              | MGT 345 | Engineering Economy | 3 |
|                |              | Humanities elective | 3 |
|                | Total | 17 |

| Senior Year    | Fall         | GME 425 | Remote Sensing | 4 |
|                | GME 451 | Geodesy | 4 |
|                | GME 454 | Humanities elective | 3 |
|                | Social Science elective | 3 |
|                | Total | 14 |

| Senior Year    | Winter       | GME 434 | Advanced Geographic Information Systems | 4 |
|                |              | GME 452 | Map Projections | 3 |
|                |              | GME 454 | GNSS Surveying | 4 |
|                |              | Science elective | 4 |
|                | Total | 15 |

| Senior Year    | Spring       | CIV 221 | Engineering Geology | 3 |
|                | GME 468 | Geomatics Practicum | 4 |
|                | Business elective (upper-division)** | 3 |
|                | Humanities elective | 3 |
|                | Total | 13 |

* Students must demonstrate advancement in educational content, courses must not be lower level than courses in the required curriculum. MATH 261 or MATH 362 recommended.

** Students must demonstrate advancement in educational content, courses must not be lower level than courses in the required curriculum. BUS 304 or BUS 356 recommended. Note: Humanities and Social Science electives must be approved by the department.

** 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. Although the management of such information often times requires the application of advanced RDBMS techniques, the ability to see a project through to completion requires fundamental project management skills as well. The analysis of geodatasets 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.

Students learn in a project-based environment how 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 has been, and 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.

**Bachelor of Science in Geomatics, Geographic Information Systems (GIS) Option**

**Curriculum**

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

| Freshman Year | Fall         | GIS 103 | Introduction to GIS | 1 |
|               |              | GME 161 | Plane Surveying I | 4 |
|               |              | MATH 111 | College Algebra | 4 |
|               |              | WRI 121 | English Composition | 3 |
|               | Total | 12 |
### 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 adviser in the Geomatics Program 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 adviser. 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 21 credits taken from the following GIS course listing.

<table>
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<tr>
<th>Course</th>
<th>Credits</th>
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<tbody>
<tr>
<td>GIS 103 Introduction to GIS</td>
<td>1</td>
</tr>
<tr>
<td>GIS 306 Geospatial Raster Analysis</td>
<td>4</td>
</tr>
<tr>
<td>GIS 316 Geospatial Vector Analysis I</td>
<td>4</td>
</tr>
<tr>
<td>GIS 332 Customizing the GIS Environment I</td>
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<tr>
<td>GIS 407 GIS Practicum</td>
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<tr>
<td>GIS 426 Geospatial Vector Analysis II</td>
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<tr>
<td>GIS 432 Customizing the GIS Environment II</td>
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<tr>
<td>GIS 446 GIS Database Development</td>
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**Requirements of Minor**

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<td>GIS 103 Introduction to GIS</td>
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<td>GIS 306 Geospatial Raster Analysis</td>
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<td>GIS 316 Geospatial Vector Analysis I</td>
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<td>GIS 332 Customizing the GIS Environment I</td>
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<td>GIS 407 GIS Practicum</td>
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<td>GIS 426 Geospatial Vector Analysis II</td>
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<td>GIS 432 Customizing the GIS Environment II</td>
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<tr>
<td>GIS 446 GIS Database Development</td>
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**Elective Courses: 16 credits required**

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<th>Credits</th>
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<tbody>
<tr>
<td>GIS 306 Geospatial Raster Analysis</td>
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<td>GIS 316 Geospatial Vector Analysis I</td>
<td>4</td>
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<tr>
<td>GIS 332 Customizing the GIS Environment I</td>
<td>4</td>
</tr>
<tr>
<td>GIS 407 GIS Practicum</td>
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</tr>
<tr>
<td>GIS 426 Geospatial Vector Analysis II</td>
<td>4</td>
</tr>
<tr>
<td>GIS 432 Customizing the GIS Environment II</td>
<td>4</td>
</tr>
<tr>
<td>GIS 446 GIS Database Development</td>
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</tr>
</tbody>
</table>

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### Oregon Institute of Technology

Freshman Year Winter
- CIV 112 Graphical Communication Techniques in Civil Engineering 3
- GIS 105 Map and Compass/GPS 1
- GME 175 Computations and Platting 4
- MATH 112 Trigonometry 4
- WRI 122 English Composition 3
- Total 15

Freshman Year Spring
- GME 134 Geographic Information Systems 4
- GME 162 Plane Surveying II 5
- MATH 251 Differential Calculus 4
- SPE 111 Fundamentals of Speech 3
- Total 16

Sophomore Year Fall
- GME 241 Boundary Law I 3
- MATH 252 Integral Calculus 4
- PHY 221 General Physics with Calculus 4
- Total 15

Sophomore Year Winter
- GME 242 Land Descriptions and Cadastre 3
- GIS 316 Geospatial Vector Analysis I 4
- MATH 254N Vector Calculus I 4
- PHY 222 General Physics with Calculus 4
- Total 15

Sophomore Year Spring
- GIS 426 Geospatial Vector Analysis II 4
- MATH 361 Statistical Methods I 4
- MIS 275 Introduction to Relational Databases 3
- PHY 223 General Physics with Calculus 4
- Total 15

Junior Year Fall
- GIS 446 GIS Database Development 4
- MIS 115 Visual BASIC Programming 4
- WRI 227 Technical Report Writing 3
- Total 15

Junior Year Winter
- GIS 205 GIS Data Integration 2
- GIS 332 Customizing the GIS Environment I 4
- SPE 321 Small Group and Team Communication 3
- Total 15

Junior Year Spring
- BUS 355 Business Law 3
- GIS 432 Customizing the GIS Environment II 4
- MGT 345 Engineering Economy 3
- Total 15
Humanities and Social Sciences Department

Lynda Baker, Department Chair

Maria Lynn Kessler, Program Director and Curriculum Coordinator, Applied Psychology

Richard Pohl, Extern Coordinator, Applied Psychology

Lynda Baker, Curriculum Coordinator, Humanities

Mark Clark, Curriculum Coordinator, Social Sciences

Professors: L. Baker, M. Clark, R. Luppi, M. Neupert, R. Pohl

Associate Professor: M. Kessler

Assistant Professors: L. Dubray, A. Huntoon

Degrees Offered
Bachelor of Science in Applied Psychology

Minors Offered
International Relations Minor
Psychology Minor

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.

International Relations Minor

The International Relations Minor provides an interdisciplinary grounding in the political, economic, and cultural factors that influence human activities across national boundaries in today's changing global environment. The minor offers integrated courses in social science, humanities, business, and communications.

This OIT offering is based upon certain academic studies and employer recommendations for the basic preparation of students seeking careers with multinational corporations, banking, the U.S. government, international organizations, and the media. The minor prepares students, both technical and non-technical, for positions that require a basic understanding of international politics and business, intercultural communication, and global cultural diversity.

Enrollment in the minor is through the Humanities and Social Sciences Department. For more information, contact the department chair or your adviser.

Requirements of the Minor

1. A minimum of 12 credits must be selected from upper-division coursework. Students must pay strict attention to prerequisite requirements.
2. Recommended tracks for specific majors:
   a. Health Sciences (including programs in Medical Imaging, Dental Hygiene, and Natural Sciences)
   Four courses from PSY 201, PSY 202, PSY 203, PSY 215, PSY 216
   Two courses from PSY 311, PSY 312, PSY 330, PSY 331
   Required courses: PSY 336 and PSY 337
   b. Management
   Four courses from PSY 201, PSY 202, PSY 203, PSY 215, PSY 216
   Two courses from PSY 330, PSY 331, PSY 332, PSY 332
   Required courses: PSY 347 and PSY 410
   c. Communication Studies
   Four courses from PSY 201, PSY 202, PSY 203, PSY 215, PSY 216
   Two courses from PSY 330, PSY 331, PSY 332
   Required courses: PSY 330, PSY 331, PSY 332
   d. Engineering Technologies
   Four courses from PSY 201, PSY 202, PSY 203, PSY 215, PSY 216
   Two courses from PSY 321, PSY 322, PSY 330, PSY 331, PSY 336, PSY 337
   Required courses: PSY 347 and PSY 410

All courses must be completed with grade “C” or better.

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 specialized courses in psychology that can enhance knowledge. A minimum of 24 credits is required to complete the minor. Students (and advisers) should follow the recommended tracks for their major, or the general track. An adviser in the Applied Psychology Program must approve any substitution of elective courses for those listed.

Enrollment in the minor is through the Humanities and Social Sciences Department; contact the department chair or your adviser for more information.

Requirements of the Minor

1. A minimum of 24 credits is required to earn the minor.
2. A minimum of 12 credits must be selected from upper-division coursework. Students must pay strict attention to prerequisite requirements.
3. Recommended tracks for specific majors:
   a. Health Sciences (including programs in Medical Imaging, Dental Hygiene, and Natural Sciences)
   Four courses from PSY 201, PSY 202, PSY 203, PSY 215, PSY 216
   Two courses from PSY 311, PSY 312, PSY 330, PSY 331
   Required courses: PSY 336 and PSY 337
   b. Management
   Four courses from PSY 201, PSY 202, PSY 203, PSY 215, PSY 216
   Two courses from PSY 330, PSY 331, PSY 332, PSY 332
   Required courses: PSY 347 and PSY 410
   c. Communication Studies
   Four courses from PSY 201, PSY 202, PSY 203, PSY 215, PSY 216
   Two courses from PSY 330, PSY 331, PSY 332
   Required courses: PSY 330, PSY 331, PSY 332
   d. Engineering Technologies
   Four courses from PSY 201, PSY 202, PSY 203, PSY 215, PSY 216
   Two courses from PSY 321, PSY 322, PSY 330, PSY 331, PSY 336, PSY 337
   Required courses: PSY 347 and PSY 410

All courses must be completed with grade “C” or better.
Applied Psychology

Maria Lynn Kessler, Program Director

Richard Pohl, Externship Coordinator

Participating Faculty: A. Huntoon, M.L. Kessler, R. Pohl

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 a variety of diverse settings. Three emphasis areas are provided. The human services emphasis focuses on preparing students for working with human service agencies and with mandated clients (e.g., criminal substance abusers, behavioral monitoring and rehabilitation of repeat offenders, problems dealing with issues of domestic violence and children at risk). An emphasis on psychology applied to business (organizational development) focuses on issues relative to management within organizations, management of organizational change and organizational development. The third emphasis area is pre-education. Students in this emphasis are prepared, through the careful selection of courses, to enter graduate programs in education. They may choose to focus on elementary, special, school counseling or secondary education with an emphasis in social sciences. Students should consult with their advisor about their interests. Students in the program share a common experience in courses offered the first two years. Then they branch out into courses tailored to the emphasis they wish to pursue. Through the use of seminars, externships and senior projects, students may prepare themselves for exciting and rewarding careers in the applied psychology field, or for additional coursework in graduate programs.

Mission Statement
The mission of the Applied Psychology Program is to enable students to apply general knowledge of psychology and in-depth knowledge and skill in specific areas of psychology to communicate effectively, think critically, behave ethically and with cultural awareness and work interpersonally with people from a wide variety of backgrounds.

Objectives
Objectives of the Applied Psychology Program are:
1. To produce graduates with effective interpersonal skills that can work in a variety of practical settings.
2. To enable students to obtain the knowledge and skills necessary for immediate employment and/or graduate study in psychology and related areas.
3. To provide opportunities for students who wish to apply psychology training to employment in business and human service related organizations or to prepare for graduate programs in related areas.
4. To serve as a minor to complement other programs on campus.

Outcomes
- Students will be able to demonstrate an understanding of the major theoretical approaches, findings and trends in psychology.
- Students will demonstrate an understanding of and be able to use major research methodologies in psychology, including design, data analysis and interpretation.
- Students will demonstrate an understanding of applications of psychology to personal, social and organizational problems and issues.

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 eventually work in counseling, education, social service, management, public relations, personnel, sales, and other fields. All of these jobs are potentially available to graduates of OIT’s Applied Psychology Program. Many of OIT’s applied psychology graduates have found jobs in the Klamath Basin. About two-thirds work in human services. Human service employers include county and state agencies, as well as a wide range of private, non-profit agencies. Human service graduates benefit from the unique focus of OIT’s Applied Psychology Program with its emphasis on hands-on applied training. Other graduates complete the Master of Arts in Teaching (MAT) Program and pursue careers in education. Most pursue teaching in the K-6th grades, but some have pursued careers in school counseling, special education, or secondary teaching. Graduates have also been employed in industry and are following management training programs. Finally, graduates have also pursued various master’s and doctoral programs in psychology (e.g., counseling, management, organization development, behavior analysis and human services) and related fields (e.g., chiropractic and social work).

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 Applied Psychology. A total of 181 credits are required for the degree. Students must complete a core program consisting of 33 credits. These core courses are PSY 201, PSY 202, PSY 203, PSY 215, PSY 216, PSY 301, PSY 313, PSY 330, PSY 331, and MATH 243 or MATH 361. In addition, students must complete an emphasis area (listed below). 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.
Emphasis Requirements

Students completing the Human Services emphasis must complete the following courses:
- PSY 220 Community Psychology
- PSY 334 Behavior Modification I
- PSY 335 Behavior Modification II
- PSY 339 Biopsychology
- PSY 341 Psychoactive Drugs I: Psychiatric Drugs
- PSY 342 Psychoactive Drugs II: Abused Drugs

Plus four credits of psychology or sociology electives by advisement.

Students completing the Organizational Development track must complete the following courses:
- PSY 347 Organizational Behavior
- PSY 360 Organizational Psychology
- PSY 361 Industrial Psychology
- PSY 410 Organizational Change and Development

Plus twelve credits of psychology, business, or technology electives by advisement.

Students completing the Pre-Education track must complete the following courses:
- PSY 311 Human Growth and Development I
- PSY 312 Human Growth and Development II
- PSY 334 Behavior Modification I
- PSY 335 Behavior Modification II
- PSY 416 Abnormal Behavior of Children and Adolescents

Plus seven credits of psychology electives by advisement.

Students in the Pre-Education track must consult closely with their adviser in the selection of elective courses to complete prerequisite courses for their desired endorsement area.

Bachelor of Science in Applied Psychology

Curriculum

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

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<td>PSY 313</td>
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</table>

* See adviser for appropriate courses.
** To complete their emphasis, students must take courses from the appropriate list that follows. Credits taken for externship or senior project do not count as emphasis electives.
*** No more than 32 credits of externship allowed for graduation without departmental approval.

Emphasis Electives

Human services emphasis: PSY 220, PSY 334, PSY 335, PSY 339, PSY 341, PSY 342, plus four credits of psychology or sociology electives by advisement.

Organization development emphasis: PSY 347, PSY 360, PSY 361, PSY 410, plus twelve credits of psychology, business, or technology electives by advisement.

Pre-Education emphasis: PSY 311, PSY 312, PSY 334, PSY 335, PSY 416, plus seven credits of psychology electives by advisement.
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 adviser 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 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 OIT. 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
WRI 121 English Composition (3)
WRI 122 English Composition (3)
WRI 123 English Composition (3)
WRI 227 Technical Report Writing (3)

Oral Communication
One course of Fundamentals of Speech or communication
SPE 111 Fundamentals of Speech (3)

INTRODUCTION TO DISCIPLINES
Arts and Letters/Humanities
3 courses of Arts and letters/Humanities
OIT only allows 3 credits of performance
or studio-based courses in this category
ART courses
COM 205 Intercultural Communication
COM 320 Advanced Intercultural Communication
ENG 104 Introduction to Literature
ENG 105 Introduction to Literature
ENG 106 Introduction to Literature
ENG 207 Seminar
ENG 211 Twentieth Century Novel: Nobel Prize Winners
ENG 212 Twentieth Century Drama
ENG 235 American Multicultural Literature
ENG 246 Reading for Fiction Writers
ENG 253 American Literature I
ENG 254 American Literature II
ENG 255 American Literature III
ENG 266 Native American Literature and Film
ENG 367 Art and Trash in Contemporary Fiction
ENG 373 British Culture and Literature: Romanticism to the Present
ENG 381 Contemporary World Literature
ENG 387 Children's Literature for Teachers
HUM 125 Introduction to Technology, Society and Values
HUM 147 Introduction to Humanities I
HUM 148 Introduction to Humanities II
HUM 149 Introduction to Humanities III
HUM 207/307/407 Seminar
HUM 225 Contemporary Theater: Ashland Plays
HUM 366 Engineering, Business and the Holocaust
PHIL 331 Ethics in the Professions
MUS 197 Chorus
MUS 207 Symphony I, II, III

Mathematics
One course of College level Math
MATH 105 Collegiate Mathematics (4)
MATH 111 College Algebra (4)
MATH 111A/111B College Algebra (4)
MATH 112 Trigonometry (4)
MATH 211 Fundamentals of Elementary Mathematics I (4)
MATH 212 Fundamentals of Elementary Mathematics II (4)
MATH 213 Fundamentals of Elementary Mathematics III (4)
MATH 243 Introductory Statistics (4)
MATH 251 Differential Calculus (4)
MATH 252 Integral Calculus (4)
MATH 255N Sequences and Series (4)
MATH 254N Vector Calculus I (4)
MATH 261 Introduction to Linear Algebra (3)

Science/Math/Computer Science
3 courses, including at least one biological or physical science with a laboratory
BIO 101 General Biology
BIO 102 General Biology
BIO 103 General Biology
BIO 105 Microbiology
BIO 111 Introduction to Environmental Sciences
BIO 112 Introduction to Data Analysis
BIO 211 Principles of Biology
BIO 212 Principles of Biology
BIO 213 Principles of Biology
BIO 216 Introduction to Veterinary Medicine
BIO 220 Cardiovascular Physiology
BIO 225 Riparian Assessment Methods
BIO 226 Introduction to Wildlife Rehabilitation
BIO 231 Human Anatomy and Physiology I
BIO 232 Human Anatomy and Physiology II
BIO 233 Human Anatomy and Physiology III
BIO 313 Botany
BIO 325 Applied Aquatic Botany
BIO 327 General Ecology
BIO 331 Human Anatomy and Physiology I
BIO 332 Human Anatomy and Physiology II
BIO 333 Human Anatomy and Physiology III
BIO 335 Cross-Sectional Anatomy
BIO 337 Aquatic Ecology
BIO 345 Medical Microbiology
BIO 346 Pathophysiology I
BIO 347 Pathophysiology II
BIO 426 Evolutionary Biology
BIO 428 Animal Behavior
BIO 434 Data Analysis Methods
BIO 436 Immunology
BIO 485 Klamath Bioregional Studies
CHE 101 Elementary Chemistry
CHE 102 Elementary Chemistry
CHE 103 Elementary Chemistry
CHE 104 Elementary Chemistry Laboratory
CHE 105 Elementary Chemistry Laboratory
CHE 106 Elementary Chemistry Laboratory
CHE 201 General Chemistry
CHE 202 General Chemistry
CHE 203 General Chemistry
CHE 204 General Chemistry Laboratory
CHE 205 General Chemistry Laboratory
CHE 206 General Chemistry Laboratory
CHE 210 Clinical Pharmacology
CHE 221 General Chemistry
CHE 222 General Chemistry
CHE 223 General Chemistry
CHE 231 Steamwater Chemistry
CHE 232 Steamwater Sampling
CHE 260 Electrochemistry for Renewable Energy Applications
CHE 315 Environmental Chemistry and Toxicology
CHE 325 Soil Science
CHE 331 Organic Chemistry I
CHE 332 Organic Chemistry II
CHE 333 Organic Chemistry III
CHE 341 Instrumental Methods/ Data Acquisition I
CHE 345 Corrosion Chemistry
CHE 346 Corrosion Chemistry Laboratory
CHE 450 Biochemistry I
CHE 451 Biochemistry II
CHE 452 Biochemistry III
University Departments

CHE 455  Water Quality Technology
CHE 465  Fate and Transport of Pollutants
CST 101  Introduction to Personal Computing
GEOG 105  Physical Geography: Geomorphology
GEOG 115  Physical Geography: Climatology
MATH 105  Collegiate Mathematics
MATH 111 College Algebra
MATH 111A College Algebra
MATH 111B College Algebra
MATH 112  Trigonometry
MATH 211  Fundamentals of Elementary Mathematics I
MATH 212  Fundamentals of Elementary Mathematics II
MATH 213  Fundamentals of Elementary Mathematics III
MATH 243  Introductory Statistics
MATH 251  Differential Calculus
MATH 252  Integral Calculus
MATH 253N  Sequences and Series
MATH 254N  Vector Calculus I
MATH 261  Introduction to Linear Algebra
PHY 201  General Physics
PHY 202  General Physics
PHY 203  General Physics
PHY 215  Topics in Astronomy
PHY 217  Physics of Medical Imaging
PHY 221  General Physics with Calculus
PHY 222  General Physics with Calculus
PHY 223  General Physics with Calculus
PHY 237  Meteorology
PHY 311  Introduction to Modern Physics
PHY 312  Introduction to Modern Physics
PHY 330  Electrical and Magnetism
PHY 410  Mathematical Methods: Fourier Optics

Social Science

Three courses of Social Science

ANTH 101  Introduction to Physical Anthropology
ANTH 102  Introduction to Archeology
ANTH 103  Introduction to Cultural Anthropology
ANTH 207  Seminar
ANTH 335  The Built Environment
ANTH 452  Globalization
ECO 201N  Principles of Economics, Microeconomics
ECO 202N  Principles of Economics, Macroeconomics
ECO 203  Principles of Economics, Special Topics
ECO 367  International Economics and Finance Management
GEOG 106  Cultural Geography I
GEOG 107  Cultural Geography II
GEOG 108  Cultural Geography III
HIST 101  History of Western Civilization
HIST 102  History of Western Civilization
HIST 105  History of Western Civilization
HIST 201  U.S. History
HIST 202  U.S. History
HIST 203  U.S. History
HIST 207  Seminar
HIST 307  Seminar
HIST 407  Seminar
HIST 215  The American Western Experience
HIST 216  American Military History
HIST 224  Technology and the Ancient World
HIST 225  The Industrial Revolution
HIST 226  Technology and the Modern World

The Engineering Profession
Modern Asia
United States Government
Introduction to World Politics
World Politics in Transition
International Conflict in the 20th Century
United States Foreign Policy
Human Services Careers
Psychology
Abnormal Psychology I
Abnormal Psychology II
Community Psychology
Basic Counseling Techniques
Human Growth and Development I
Human Growth and Development II
Psychological Research Methods I
Psychological Research Methods II
Field Placement Seminar
Theories of Personality
Theories of Personality
Stress Management
Social Psychology I
Social Psychology II
Behavior Modification I
Behavior Modification II
Health Psychology I
Health Psychology II
Biopsychology
Psychoactive Drugs I:
Psychiatric Drugs
Psychoactive Drugs II: Abused Drugs
Organizational Behavior
Cognitive Restructuring I
Cognitive Restructuring II
Evolutionary Psychology
Organizational Psychology
Industrial Psychology
Environmental Psychology
Therapeutic Communities
Advanced Counseling Techniques
Applied Psychology Methods II
Applied Psychology Methods III
Organizational Change and Development
Abnormal Behavior of Children and Adolescents
Applied Psychology Externship
Animal Behavior
Psychological Trauma
Performance Management
Organizational Structure
Introduction to Sociology
Marriage and Family Living
Criminology
Management Department

Marla Miller, Department Chair

Richard Bailey, Curriculum Coordinator, Accounting

Hallie Neupert, Curriculum Coordinator, Information Technology

Hallie Neupert, Curriculum Coordinator, Operations Management

Grant Kirby, Program Director, Information Technology (Portland)

Marla Miller, Curriculum Coordinator, Entrepreneurship/Small Business Management

Marla Miller, Curriculum Coordinator, Marketing

Professors: R. Bailey, M. Huntley, C. Jones, M. Sevigny

Associate Professors: G. Kirby, M. Miller, C. Morgan, H. Neupert, J. Wolverton

Assistant Professor: M. Kirshner

Degrees Offered
Bachelor of Science in Allied Health Management
Bachelor of Science in Information Technology, with options in:
Accounting
Applications Development
Business/Systems Analysis
Health Informatics
Bachelor of Science in Management, with options in:
Accounting
Entrepreneurship/Small Business Management
Marketing
Bachelor of Science in Operations Management

Minors Offered
Business
International Business
Information Technology

Specializations Offered
Accounting
Entrepreneurship/Small Business Management
Marketing

Certificate Offered
Accounting (post baccalaureate)

The Management Department prepares students to take their place as leaders and managers in contemporary public and private organizations. Faculty in this department 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 systems, economics, ethics, organizational behavior, business law and presentations. These courses, along with program-specific courses, prepare students for their senior year which includes a senior project sequence and a capstone course.

As a result of this unique combination of resources and coursework, the Management Degree Programs remain vital and up-to-date, providing students with the technical tools of management and interpersonal skills that employers most desire. Equally important, each graduate will be ready to perform as an effective citizen in a culturally diverse, global work place.

Program Outcomes
Management Department graduates will:
1. Understand the functional areas of accounting, marketing, finance, management and economics.
2. Understand the legal and social environment of business.
3. Understand the global environment of business.
4. Understand the ethical obligations and responsibilities of business.
5. Be able to evaluate a business problem using business tools.
6. Be able to access and use information in business applications.
7. Be effective communicators.
8. Be effective team and/or group members.
9. Be able to apply knowledge of business concepts and functions in an integrated manner.

Degree Completion and Co-enrollment at Community Colleges
The Management Department has worked with many Oregon community colleges to develop Joint Enrollment, Transfer Credit (Articulation) Agreements and course sequences so that students can complete a degree with coursework taken from multiple institutions. See the general education requirements section of this catalog, the OIT Registrar’s Web site, or a management adviser for additional information. Coursework is delivered in a traditional classroom/computer lab setting at the Klamath Falls and Portland campuses. A capstone Senior Project provides management students with an opportunity to integrate their educational experience in the context of a “real world” business problem or project.

Distance Education
Many of the core management courses are available online to facilitate the needs of degree-completion students. Web courses are particularly appropriate for students capable of self-directed educational activities. The Information Technology Applications Development Option and the Operations Management degree are available online.

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. 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 OIT.

Accreditation
The Management programs are accredited by the International Assembly for Collegiate Business Education (IACBE).
Program Note
Students graduating with a Management degree are required to take a standardized exit exam in their last year.

Allied Health Management

This program bridges two different disciplines and departments: Allied Health and Management. The Bachelor of Science in Allied Health Management offers an emphasis for allied health majors. The emphasis must be in an area that requires a national registry, licensure or certification.

After the student has successfully completed the registry exam in their chosen allied health field, s/he may complete management courses and an associate degree. Students may choose to take the courses offered through the Distance Education Program or the traditional style in the classroom. Students who fulfill the requirements of this degree completion program will be awarded a B.S. in Allied Health Management, with an emphasis in their specialty.

Career Opportunities
Graduates will obtain their jobs based on their allied health degree. They will be prepared to advance in their career with the Allied Health Management degree. Duties involve the use of highly advanced technology, compassionate patient care, management of the lab/department and supervision of other technicians/technologists. Graduates are employed by hospitals, outpatient testing facilities, clinics, and bio-medical equipment manufacturers.

Student Preparation
Students must have successfully completed a registry, licensure or certification. Students should also have completed an associate degree program in their allied health field.

Degree Completion Program
The Allied Health Management Program offers an online or classroom-based degree completion program. The program is offered externally, utilizing mail, e-mail, fax and Internet delivery and requires collaborative learning. Computer/Internet access is required. Each prospective student's academic and registry credits will be individually evaluated to determine acceptability of the coursework and the sequencing of the professional courses. Every student must meet the OIT general education requirements for graduation.

Admissions Procedures and Requirements
Any B.S. applicant who meets the general admissions requirements may enroll in the Allied Health Management Program. To be eligible for admission, applicants must meet the following criteria:

1. Documentation of completion of registry, certification or licensure in an allied health field.
2. Associate degree in an allied health field.
3. All applicants are required to submit an official Application for Admission to the Distance Education Department at OIT, accompanied by a $100 non-refundable fee and official transcripts of each college or university attended.

Acceptance to the Allied Health Management Degree Program is contingent upon acceptance to OIT.

Graduation Requirements
Minimum graduation requirements for the B.S. in Allied Health Management are the successful completion of a nationally recognized licensure exam or completion of a certificate appropriate to the student's allied health major and all courses required for the B.S. degree. They must complete 60 credits of upper-division (300-400 level) coursework from a baccalaureate degree granting institution; and complete at least 45 credits from OIT. For the Allied Health Management degree, 181 credits are required.

Allied Health Transfer Credits
If fewer than 44 allied health credits are transferred in, additional electives, preferably in the field of study, must be taken.

<table>
<thead>
<tr>
<th>Year</th>
<th>Fall</th>
<th>Winter</th>
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<tbody>
<tr>
<td>Sophomore</td>
<td>BIO 231 Human Anatomy and Physiology I 4</td>
<td>Human Anatomy and Physiology II 4</td>
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<tr>
<td></td>
<td>COM 205 Intercultural Communication 3</td>
<td>Principles of Economics, Microeconomics 3</td>
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<td></td>
<td>SPE 111 Fundamentals of Speech 3</td>
<td>MATH 243 Introductory Statistics 4</td>
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<tr>
<td></td>
<td>WRI 121 English Composition 3</td>
<td>WRI 122 English Composition 3</td>
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<tr>
<td>Senior</td>
<td>BUS 317 Principles of Managerial Accounting 4</td>
<td>Human Resource Management 3</td>
</tr>
<tr>
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<td>BUS 337 Principles of Health Care Marketing 3</td>
<td>BUS 441 Leadership 3</td>
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<td></td>
<td>BUS 496 Senior Project 3</td>
<td>BUS 496 Senior Project 3</td>
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<tr>
<td>Junior</td>
<td>BUS 308 Principles of International Business 3</td>
<td>Medical Terminology 2</td>
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<td>BUS 467 Service Management 3</td>
<td>Elective(up-division) 3</td>
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<td>PHIL 331 Ethics in the Professions 3</td>
<td>Elective(up-division) 3</td>
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<td>Principles of Managerial Accounting 4</td>
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<td>BUS 349 Human Resource Management 3</td>
<td>Human Resource Management 3</td>
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<tr>
<td></td>
<td>BUS 467 Service Management 3</td>
<td>BUS 441 Leadership 3</td>
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<td>BUS 496 Senior Project 3</td>
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<tr>
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<td>BUS 316 Total Quality in Health Care 3</td>
<td>BUS 355 Business Law 3</td>
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<td>BUS 355 Business Law 3</td>
<td>BUS 447 Controversial Issues in Management 3</td>
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<td>BUS 497 Senior Project 3</td>
<td>BUS 497 Senior Project 3</td>
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<td></td>
<td>BUS 410 Organizational Change and Development 3</td>
<td>PSY 410 Organizational Change and Development 3</td>
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<td>WRI 410 Proposal and Grant Writing 3</td>
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Information Technology

Degree Offered
Bachelor of Science in Information Technology with options in:
- Accounting
- Applications Development
- Business/Systems Analysis
- Health Informatics

Objectives
The Bachelor of Science in Information Technology with its four options offers a challenging, state-of-the-art education for those interested in learning the dynamic and growing field of information technology. The field is interdisciplinary, with applications to all aspects of the economy. Graduating students are prepared to bridge the technology and management disciplines in their organizations. Core business disciplines taught include analytical skills and problem solving; business organization and management; project management; leadership, teams, and communications. In addition to the core business disciplines students choose an information technology focus in one of four options: applications development, business/systems analysis, health informatics or accounting. Each option is designed to produce graduates with the competencies necessary to succeed in the workplace or pursue further graduate level education.

Career Opportunities
The OIT Information Technology degree with four options prepares students for a wide range of professions including accounting information systems, database administration, systems analyst, business systems consultant, network analyst, software application specialist, PC support technician, technical writer, Web administrator and as vendor representatives for both hardware and software firms. Information Technology graduates are currently employed at firms including Consolidated Freightways, Hewlett-Packard, Microsoft and Intel. Through a combination of technical skills and business understanding, Information Technology graduates are uniquely prepared for faster advancement than many of their contemporaries.

Graduation Requirements
Graduation requirements for the Bachelor of Science Degree in Information Technology include 181 credit hours for the Accounting Option, 181 credit hours for the Applications Development option, 181 credit hours for the Business/Systems Analysis option, and 181 credits for the Health Informatics option.

Accounting Option
The Information Technology Accounting Option combines coursework in accounting and information technology. Students will acquire both technical and accounting skills needed to prepare them for successful careers in accounting and accounting information systems. This unique program meets the needs of accounting students entering today’s technology-oriented marketplace. Students entering this program will receive exposure and preparation in information systems. In addition, they will develop the skills and tools required to analyze, design, and implement different types of accounting systems.

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. This program prepares students for a variety of careers in accounting, financial management, management advisory services, and information technology.

Bachelor of Science in Information Technology, Accounting Option

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

Freshman Year
- Fall
  - MATH 111 College Algebra 4
  - PSY 201 Psychology 3
  - WRI 121 English Composition Lab Science elective 3
- Total 14

- Winter
  - BUS 215 Principles of Management 3
  - ECO 201N Principles of Economics Microeconomics 3
  - MIS 102 Spreadsheet Software Laboratory 1
  - SPE 111 Fundamentals of Speech 3
  - WRI 122 English Composition Math/Science/Social Science elective 3
- Total 16

Sophomore Year
- Fall
  - ACC 201 Principles of Accounting I 4
  - MATH 361 Statistical Methods I 4
  - MIS 311 Introduction to Information Systems 3
  - WRI 227 Technical Report Writing 3
  - Mathematics elective 3
- Total 15

- Winter
  - ACC 202 Principles of Accounting II 4
  - BUS 306 Principles of Marketing 3
  - MATH 371 Finite Mathematics and Calculus I 4
  - MIS 256 Hardware/Software Integration 4
- Total 14

Junior Year
- Fall
  - ACC 301 Intermediate Accounting I 4
  - BUS 356 Business Presentations 4
  - MIS 312 Systems Analysis I 4
  - MIS 341 Relational Database Design I 4
- Total 13

- Winter
  - ACC 320 Cost Accounting I 4
  - ACC 325 Finance 4
  - ACC 332 Intermediate Accounting II 4
  - WRI 327 Advanced Technical Writing 3
- Total 16

Senior Year
- Winter
  - ACC 333 Intermediate Accounting III 4
  - ACC 405 Accounting Information Systems 4
  - PSY 347 Organizational Behavior Management Information Systems elective* 3
- Total 14
Applications Development Option

The Information Technology Applications Development Option focuses on the acquisition of theory and technical competencies to prepare students for successful careers as applications programmers. The curriculum is designed to produce graduates with the competencies, skills and attitudes necessary for success in the workplace or further graduate education. The management components include analytical skills and problem solving; business organization and management; project management; leadership, teams, and communications. Information technology skill areas include database development, applications development, Web development, technical support, telecommunications and additional technical electives.

Bachelor of Science in Information Technology, Applications Development Option

Curriculum

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

<table>
<thead>
<tr>
<th>Senior Year</th>
<th>Fall</th>
<th>Total</th>
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<tbody>
<tr>
<td>ACC 411</td>
<td>Income Tax Procedures</td>
<td>4</td>
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<tr>
<td>ACC 435</td>
<td>Auditing</td>
<td>4</td>
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<tr>
<td>ACC 496</td>
<td>Senior Project</td>
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<td>BUS 308</td>
<td>Principles of International Business</td>
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<td>Math/Science/Social Science elective</td>
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<td>ACC 431</td>
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<tr>
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<tr>
<td>Management Information Systems elective*</td>
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<td>Social Science elective</td>
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<tr>
<td>ACC 465</td>
<td>Case Studies in Accounting</td>
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<td>BUS 355</td>
<td>Business Law</td>
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<td>MATH 361</td>
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<tr>
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<tr>
<td>BUS 306</td>
<td>Principles of Marketing</td>
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<td>BUS 356</td>
<td>Business Presentations</td>
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* Any MIS course that is not already required.

Bachelor of Science in Information Technology, Business/Systems Analysis Option

Curriculum

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

<table>
<thead>
<tr>
<th>Freshman Year</th>
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<td>MIS 115</td>
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<td>WRI 121</td>
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<tr>
<td>BUS 456</td>
<td>Business Research Methods</td>
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<td>MIS 375</td>
<td>Decision Support Systems</td>
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<td>WRI 327</td>
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<tr>
<td>ACC 325</td>
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<td>MATH 327</td>
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<tbody>
<tr>
<td>BUS 306</td>
<td>Principles of Marketing</td>
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<td>MIS 497</td>
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Business/Systems Analysis Option

The Information Technology Business/Systems Analysis Option integrates technical, business, and interpersonal skills to prepare students for successful careers as business/systems analysts. The curriculum is designed to produce graduates with the competencies, skills and aptitudes necessary for success in the workplace or further graduate education. The management components include analytical skills and problem solving; business organization and management; project management; leadership, teams, and communications. Students gain theoretical and practical experience with systems analysis and design, project management, personal computers, operating systems, applications, networks, Web page design and development and databases.

Bachelor of Science in Information Technology, Business/Systems Analysis Option

Curriculum

Freshman Year

<table>
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<th>Fall</th>
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<tr>
<td>BUS 215</td>
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Senior Year

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<tbody>
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<td>BUS 456</td>
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</table>
Oregon Institute of Technology

Curriculum

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

**Freshman Year Fall**
- ECO 201N Principles of Economics, Microeconomics 3
- MIS 215 Business Application Programming 4
- SPE 111 Fundamentals of Speech 3
- Lab Science elective 4

**Total** 14

**Freshman Year Spring**
- BUS 306 Principles of Marketing 3
- ECO 202N Principles of Economics, Macroeconomics 3
- MIS 275 Introduction to Relational Databases 3
- PSY 201 Psychology 3
- WRI 122 English Composition 3

**Total** 15

**Sophomore Year Fall**
- ACC 201 Principles of Accounting I 4
- MATH 361 Statistical Methods I 4
- MIS 311 Introduction to Information Systems 3
- WRI 227 Technical Report Writing 3

**Total** 15

**Sophomore Year Spring**
- MATH 371 Finite Mathematics and Calculus I 4
- MIS 102 Spreadsheet Software Laboratory 1
- SPE 321 Small Group and Team Communication 3
- Math/Science/Social Science elective 3

**Total** 15

**Junior Year Fall**
- BUS 355 Business Law 3
- MIS 322 Systems Analysis II 4
- WRI 350 Documentation Development 3
- Math/Science/Social Science elective 3

**Total** 15

**Junior Year Spring**
- BUS 456 Business Research Methods 3
- MIS 225 Business on the Internet 4
- PSY 347 Organizational Behavior 3
- Math/Science/Social Science elective 3

**Total** 15

**Senior Year Fall**
- MGT 461 Lean Management I 3
- MIS 375 Decision Support Systems 3
- MIS 496 Senior Project Management 4
- WRI 327 Advanced Technical Writing 3

**Total** 15

**Senior Year Winter**
- ANTH 452 Globalization or
- PSCI 326 World Politics in Transition 3
- MIS 497 Senior Project II 3
- Math/Science/Social Science elective 3
- Math/Science/Social Science elective 3
- Technical elective* 3

**Total** 15

* Any MIS or CST class approved by your adviser which is not required in your program excepting CST 101 and CST 102. Alternatively, ACC 405 or any appropriate GIS course approved by your adviser.

**Health Informatics Option**

**Objectives and Career Opportunities**

The U.S. health care system is in the midst of a technology transformation, moving from paper-based records to integrated electronic health information systems. Technology transformation, specifically electronic health records, data warehouses and integrated health information systems, is changing the face of health care organizations and the delivery of care. One of the key factors in assuring a successful transformation is meeting the needs for highly qualified health informatics professionals and specialists.

The new roles for health informatics professionals are the result of the convergence of information management and information technologies. Health informatics professionals work in operational and management positions throughout the health care industry in such locales as hospitals, clinics, managed care organizations, software vendors and government agencies. Health informatics professionals are being called upon to design and use emerging information technologies with the goal of helping providers and patients access and utilize key information in both clinical and business management. Health Informatics provides support in areas such as clinical decision making, research, financial and revenue cycle management, and personal health management.

**Degree Requirements**

The Health Informatics option requires 181 term hours. Required course work is outlined in the curriculum section. Transfer students should consult with the Registrar’s Office and the Management Department to determine which of their courses will satisfy OIT course requirements.

**Bachelor of Science in Information Technology, Health Informatics Option**

**Curriculum**

Degree Requirements

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

**Freshman Year Fall**
- PSY 201 Psychology 3
- SPE 111 Fundamentals of Speech 3
- WRI 121 English Composition 3
- Math/Science/Social Science elective 3

**Total** 15

**Freshman Year Winter**
- BIO 200 Medical Terminology 2
- ECO 201N Principles of Economics, Microeconomics 3
- MATH 111 College Algebra 4
- MIS 102 Spreadsheet Software Laboratory 1
- WRI 122 English Composition 3

**Total** 15

**Sophomore Year Fall**
- BIO 103 General Biology 4
- ECO 202N Principles of Economics, Macroeconomics 3
- MIS 275 Introduction to Relational Databases 3
- Math/Science/Social Science elective 3

**Total** 15

**Sophomore Year Winter**
- MATH 361 Statistical Methods I 4
- MIS 115 Visual BASIC Programming 4
- MIS 217 Health Care Systems and Policy 3
- MIS 255 Health Informatics Concepts and Practices 3
- MIS 311 Introduction to Information Systems 3

**Total** 17
### University Departments

**Core Courses**

Graduation requirements for the Bachelor of Science in Management include 181 credit hours for the Entrepreneurship/Small Business Management option and 181 credit hours for the Accounting option.

#### Accounting Option

The accounting option 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.

#### Marketing Programs

**Degrees Offered**

Bachelor of Science in Management, with options in:
- Accounting
- Entrepreneurship/Small Business Management
- Marketing

**Objectives**

The Management curriculum integrates a solid core of business/management courses with the unique benefits of one of the country's leading institutes of technology. Degree options include accounting, entrepreneurship/small business management, and marketing. The mission of the Management Department is to prepare 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. Students will also be prepared for graduate level education, such as the Master's in Business Administration (MBA) degree.

#### Career Opportunities

Recruiters from industry and government agencies regularly visit the campus in search of Management Department bachelor degree candidates. Initial job titles include staff accountant, cost analyst, business unit manager, supervisor, marketing specialist, and sales manager.

#### Graduation Requirements

Graduation requirements for the Bachelor of Science degree in Management include 181 credit hours for the Entrepreneurship/Small Business Management option, 181 credit hours for the Marketing option, and 182 credit hours for the Accounting option.

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<thead>
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<th>Sophomore Year</th>
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<tr>
<td>MATH 371</td>
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<td>SPE 321</td>
<td>Small Group and Team Communication 3</td>
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<td>Systems Analysis I 4</td>
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<td>MIS 341</td>
<td>Relational Database Design I 4</td>
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<td>MIS 345</td>
<td>Health Care Information Systems Management 3</td>
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<td>MIS 322</td>
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<td>Relational Database Design II 4</td>
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<td>Information and Communication Systems in Health Care 3</td>
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<tbody>
<tr>
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<td>MIS 272</td>
<td>Introduction to Networking 4</td>
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<td>MIS 343</td>
<td>Relational Database Design III 4</td>
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<td>MIS 351</td>
<td>Enterprise Network Design I 4</td>
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<td>WRI 327</td>
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<tbody>
<tr>
<td>BUS 316</td>
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<td>BUS 337</td>
<td>Principles of Health Care Marketing 3</td>
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<tr>
<td>MIS 445</td>
<td>Legal, Ethical and Social Issues in Health Care Technology 3</td>
</tr>
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<td>MIS 497</td>
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<tbody>
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<td>BUS 478</td>
<td>Cases in Strategy and Policy 3</td>
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<tr>
<td>MIS 479</td>
<td>Current Topics in Information Technology 3</td>
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<td>MIS 498</td>
<td>Senior Project III 3</td>
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</table>

* Any MIS, preferably MIS 390/MIS 490 or CST class approved by your adviser which is not required in your program, excepting CST 101 and CST 102. Alternatively, any appropriate GIS course approved by your adviser.
Entrepreneurship/Small Business Management Option

Students selecting the entrepreneurship/small business management option should equip themselves to be managers with complete understanding of all aspects of a business—either a small business or a business unit manager in a larger business. The focus is on the unique demands placed on this type of manager. Skills in writing business plans, starting and operating a business, cash flow management, costing and pricing products and global opportunities are emphasized and developed.

Bachelor of Science in Management, Entrepreneurship/Small Business Management Option

Curriculum

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

Freshman Year

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<tr>
<th>Fall</th>
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<tbody>
<tr>
<td>MATH 111 College Algebra</td>
<td>ACC 203 Principles of Managerial Accounting</td>
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<td>PSY 201 Psychology</td>
<td>ACC 205 Computerized Accounting</td>
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<td>WRI 121 English Composition</td>
<td>BUS 355 Business Law</td>
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<td>MIS 375 Decision Support Systems</td>
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<td>Lab Science elective</td>
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Sophomore Year

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<tr>
<td>BUS 215 Principles of Management</td>
<td>ACC 320 Cost Accounting I</td>
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<tr>
<td>ECO 201N Principles of Economics, Microeconomics</td>
<td>ACC 325 Finance</td>
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<td>MIS 102 Spreadsheet Software Laboratory</td>
<td>ACC 332 Intermediate Accounting II</td>
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<td>SPE 111 Fundamentals of Speech</td>
<td>ACC 405 Accounting Information Systems</td>
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<td>WRI 122 English Composition</td>
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Junior Year

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<tr>
<td>ACC 411 Income Tax Procedures</td>
<td>ACC 431 Advanced Accounting I</td>
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<td>ACC 435 Auditing</td>
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<td>ACC 496 WRI 327 Advanced Technical Writing</td>
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Senior Year

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<tr>
<td>ACC 412 Corporate Taxation</td>
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<td>ACC 435 Advanced Accounting</td>
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Sophomore Year

<table>
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<th>Fall</th>
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<tbody>
<tr>
<td>BUS 306 Principles of Marketing</td>
<td>ACC 203 Principles of Managerial Accounting</td>
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<tr>
<td>BUS 349 Human Resource Management</td>
<td>BUS 397 Labor Relations</td>
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<td>MATH 371 Finite Mathematics and Calculus I</td>
<td>MIS 225 Business on the Internet</td>
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<tr>
<td>PHIL 331 Ethics in the Professions</td>
<td>MIS 375 Decision Support Systems</td>
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</table>

Marketing Option

The marketing option provides students with a broad background in business management with a strong emphasis in modern marketing concepts and practices. Marketing graduates enjoy careers in management, advertising, research, consulting, distribution, sales and entrepreneurial enterprises. This program provides the student with a core of management courses, in-depth business computer applications, detailed marketing courses, experience on individual and team
projects, and preparation for entry into a master’s program.

**Bachelor of Science in Management, Marketing Option**

**Curriculum**

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

**Freshman Year Fall**
- COM 205 Intercultural Communication 3
- MATH 111 College Algebra 4
- WRI 121 English Composition 3
- Lab Science elective 4
- Total 17

**Freshman Year Winter**
- BUS 215 Principles of Management 3
- ECO 201N Principles of Economics, Microeconomics 3
- MIS 102 Spreadsheet Software Laboratory 1
- SPE 111 Fundamentals of Speech 3
- WRI 122 English Composition 3
- Math/Science/Social Science elective 3
- Total 16

**Freshman Year Spring**
- ECO 202N Principles of Economics, Macroeconomics 3
- MIS 275 Introduction to Relational Databases 3
- SPE 321 Small Group and Team Communication 3
- WRI 227 Technical Report Writing 3
- Math/Science/Social Science elective 3
- Total 15

**Sophomore Year Fall**
- ACC 201 Principles of Accounting I 4
- MATH 361 Statistical Methods I 4
- MIS 311 Introduction to Information Systems 3
- WRI 227 Technical Report Writing 3
- Total 14

**Sophomore Year Winter**
- BUS 306 Principles of Marketing 3
- MATH 371 Finite Mathematics and Calculus I 4
- PHIL 331 Ethics in the Professions 3
- Math/Science/Social Science elective 3
- Elective 3
- Total 16

**Sophomore Year Spring**
- ACC 203 Principles of Managerial Accounting 4
- MIS 225 Business on the Internet 4
- MIS 375 Decision Support Systems 3
- Math/Science/Social Science elective 3
- Total 14

**Junior Year Fall**
- ACC 325 Finance 4
- BUS 356 Business Presentations 4
- BUS 399 Marketing Special Topics 3
- BUS 467 Service Management 3
- Total 14

**Junior Year Winter**
- ANTH 452 or BUS 308 Principles of International Business 3
- BUS 318 Consumer Behavior 3
- BUS 319 Advertising Management 3
- PSY 347 Organizational Behavior 3
- WRI 327 Advanced Technical Writing 3
- Total 15

**Junior Year Spring**
- BUS 326 Sales and Sales Management 3
- BUS 355 Business Law 3
- BUS 456 Business Research Methods 3
- PSY 410 Organizational Change and Development 3
- Math/Science/Social Science elective 3
- Total 15

**Senior Year Fall**
- ACC 325 or MGT 461 Lean Management I 3
- MGT 462 Lean Management II 3
- Elective 3
- Elective 3
- Total 15

**Senior Year Winter**
- BUS 435 New Product Development 3
- BUS 496 Senior Project 3
- BUS 497 Marketing Plan Development 3
- Senior Project 3
- Elective 3
- Elective 3
- Total 15

**Senior Year Spring**
- BUS 434 Global Marketing 3
- BUS 478 Cases in Strategy and Policy 3
- WRI 420 Document Design 3
- Elective 3
- Elective 3
- Elective 3
- Total 15

**Specialization Programs**

OIT offers three specializations as a complement to the three Bachelor of Science degree options in Management. These are in Accounting, Entrepreneurship and Small Business Management, and Marketing. The courses included in these programs have been selected from the curricular content of the three corresponding degree options.

**Accounting**

OIT’s specialization in Accounting prepares the student for a wide range of accounting-related positions in modern technological industries, financial institutions and other service-oriented businesses. The program includes training in computer software essential to accounting functions. This hands-on exposure can qualify the student for work in many high technology industries which utilize computer accounting applications.

**Required Courses**
- ACC 201 Principles of Accounting I 4
- ACC 202 Principles of Accounting II 4
- ACC 203 Principles of Managerial Accounting 4
- ACC 205 Computerized Accounting 3
- MIS 101 Word Processing Software Laboratory 1
- MIS 102 Spreadsheet Software Laboratory 1
- MIS 103 Presentation Graphic Software Laboratory 1

**Entrepreneurship and Small Business Management**

OIT’s specialization in Entrepreneurship/Small Business provides the student with foundational skills and background in business management emphasizing entrepreneurship. The student should learn skills needed to start a business successfully, gain the knowledge required to run small businesses, and develop the entrepreneurship skills to make big companies run like small companies.

**Required Courses**
- BUS 215 Principles of Management 3
- BUS 306 Principles of Marketing 3
- BUS 314 Entrepreneurship 3
- BUS 335 Small Business Management 3
- BUS 434 Global Marketing 3
- BUS 447 Controversial Issues in Management 3

**Marketing**

OIT’s specialization in Marketing provides the student with a foundational background in business management with an emphasis in modern marketing concepts and practices. Upon completion, the student should be better qualified for a career in management, advertising, consulting, distribution or sales.

**Specialization Programs**

OIT offers three specializations as a complement to the three Bachelor of Science degree options in Management. These are in Accounting, Entrepreneurship and Small Business Management, and Marketing. The courses included in these programs have been selected from the curricular content of the three corresponding degree options.
Required Courses
BUS 215 Principles of Management 3
BUS 306 Principles of Marketing 3
BUS 318 Consumer Behavior 3
BUS 319 Advertising Management 3
BUS 326 Sales and Sales Management 3

Renewable Energy Management Emphasis
The Management Department offers students the opportunity to complete a Renewable Energy Management emphasis under the Bachelor of Science Degree in Management, Small Business Management and Entrepreneurship option or the Operations Management degree program. In addition to the fundamental management curriculum, the emphasis requires additional coursework in chemistry, management information systems, humanities, history, economics and management. 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 3
CHE 204 General Chemistry Laboratory 1
or
PHY 201 General Physics 4
MATH 112 Trigonometry 4
ECO 357 Energy Economics and Policy 3
HIST 356 A History of Energy 3
HUM 125 Introduction to Technology, Society and Values 3
REE 201 Introduction to Renewable Energy 3
MIS 115 Visual BASIC Programming 4
MGT 212 Fundamentals of Renewable Energy Management 3

Operations Management

Degree Offered
Bachelor of Science in Operations Management

Objectives
The Operations Management program prepares students for leadership positions in the production and service industries. Students should develop mastery of concepts, tools, and skills in management sciences and specialties. Particular emphasis is directed toward developing the ability to contribute significantly to the improvement of productivity in a quality oriented environment and to manage effectively in a team based work environment. Students will also be prepared for graduate level education, such as the Master’s in Business Administration degree.

Career Opportunities
Recruiters from industry and government agencies regularly visit the campus in search of bachelor’s degree candidates in operations management. 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.

Students selecting the Operations Management degree will equip themselves to be managers in the challenging environment of modern manufacturing and service industries. Upon graduation they 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.

Graduation Requirements
As prescribed by the Management Department, graduation requirements for the Bachelor of Science degree in Operations Management include 180 credit hours.

Bachelor of Science in Operations Management

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

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<td>PSY 201</td>
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<tbody>
<tr>
<td>MATH 111</td>
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<td>MIS 102</td>
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<tr>
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<tr>
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<tr>
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<tr>
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<tr>
<td>BUS 355</td>
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<tbody>
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<td>MGT 461</td>
<td>Lean Management I 3</td>
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<td>Decision Support Systems 3</td>
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<td>WRI 327</td>
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Oregon Institute of Technology
Information Technology Minor

The Information Technology (IT) Minor recognizes the achievement of 21 credits in technical courses. Some of the courses may be included in the student's requirements for a bachelor's degree from OIT. The IT minor may prove valuable to management or technical students who want to demonstrate that they have additional skills in management information system and information technology areas. It may enhance employability and improve graduate school possibilities. The minor is open to all majors except IT.

Requirements of Minor:

- MIS 115 Visual BASIC Programming 4
- MIS 311 Introduction to Information Systems 3
- MIS 215 Business Application Programming 4
- MIS 312 Systems Analysis I 4
- MIS 275 Introduction to Relational Databases 3
- MIS 341 Relational Database Design I 4
- MIS 342 Relational Database Design II 4
- MIS 375 Decision Support Systems 3
- Total 21

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. It may enhance employability and improve graduate school possibilities. This minor is open to all majors except those in the Management Department.

Requirements of Minor:

- BUS 308 Principles of International Business 3
- BUS 405 Intercultural Communication 3
- BUS 434 International Economics and Finance Management 4
- IMGT 488 Multinational Operations 3
- PSCI 250 Introduction to World Politics 3
- BUS 387 International Human Resource Management 3
- PSCI 326 World Politics in Transition 3
- PSCI 497 United States Foreign Policy 3
- MIS 311 Introduction to Information Systems 3
- Total 22

Business Minor

The Minor in Business recognizes the achievement of 21 credits in business courses, some of which can be 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 OIT. The Minor in Business may prove valuable to a technical 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 those in the Management Department.

Requirements of Minor:

- ACC 201 Principles of Accounting I 4
- ACC 203 Principles of Accounting III 4
- BUS 215 Principles of Management 3
- BUS 304 Engineering Management 3
- BUS 317 Health Care Management 3
- BUS 306 Principles of Marketing 3
- PSY 347 Organizational Behavior 3
- Elective 3
- Elective 3
- Elective 3
- Total 12

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 adviser to select business courses that would be most applicable to their major and/or career goals.
Manufacturing and Mechanical Engineering and Technology Department

Brian Moravec, Department Chair

Joe Stuart, Program Director, Undergraduate Manufacturing Engineering Technology

Wangping Sun, Program Director, Graduate Manufacturing Engineering Technology

Hugh Currin, Program Director, Mechanical Engineering

Brian Moravec, Program Director, Mechanical Engineering Technology

Geoffrey Peter, Program Director, Portland Programs

David Woodall, Program Director, Boeing Program

Professors: T. Brower, H. Currin, R. Shih, B. Moravec, L. Wolf, D. Woodall

Associate Professors: J. Anderson, N. Mead

Assistant Professors: D. Culler, I. Demeshko-Prosnik, G. Peter, J. Stuart, W. Sun

Degrees Offered
Master of Science in Manufacturing Engineering Technology
Bachelor 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 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 alumni to achieve within five years of graduation. The Program Educational Objectives of OIT’s Manufacturing Engineering Technology Program are to produce alumni who:

- are able to analyze and design practical mechanical and manufacturing systems.
- communicate effectively and work well on team-based engineering projects.
- succeed in entry-level manufacturing engineering positions.
- pursue continued professional development.
- pursue engineering technology graduate studies, if desired.

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.

Objectives of the Program
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.

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.

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.

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 stu-
dents have the opportunity to participate in the state-wide MECOP internship program. For information, see the following Web site: http://mecop.ous.edu.

**Accreditation**
The Bachelor of Science in Manufacturing Engineering Technology is accredited by the Technology Accreditation Commission (TAC) of the Accreditation Board for Engineering and Technology (ABET), 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.

**Degree Requirements—Master of Science**
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

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 adviser to complete an academic plan.

**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 adviser for specific details as to which courses qualify as manufacturing electives.

### Bachelor of Science in Manufacturing Engineering Technology

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

**Freshman Year—Fall**
- **MATH 111** College Algebra 4
- **MET 111** Orientation I 2
- **WRI 121** English Composition 3

**Total** 15

**Freshman Year—Winter**
- **CHE 101** Elementary Chemistry 3
- **CHE 104** Elementary Chemistry Laboratory 1
- **MATH 112** Trigonometry 4
- **MFG 120** Manufacturing Processes I 4
- **WRI 122** English Composition 3

**Total** 17

**Freshman Year—Spring**
- **MATH 251** Differential Calculus 4
- **MFG 103** Introductory Welding Processes 3
- **MET 241** CAD for Mechanical Design I 2
- **SPE 111** Fundamentals of Speech 3

**Total** 15

**Sophomore Year—Fall**
- **ENGR 211** Statics ** 4
- **MATH 252** Integral Calculus 4
- **MFG 314** Geometric Dimensioning and Tolerancing 3
- **PHY 201/221** General Physics 4
- **MET 242** CAD for Mechanical Design II 2

**Total** 17

**Sophomore Year—Winter**
- **ENGR 213** Strength of Materials ** 4
- **MATH 361** Statistical Methods I 4
- **MFG 112** Introduction to Manufacturing Processes 3
- **PHY 202/222** General Physics 4

**Total** 15

**Sophomore Year—Spring**
- **ENGR 236** Fundamentals of Electric Circuits 3
- **MATH 362** Statistical Methods II 4
- **MET 160** Materials I 3
- **WRI 227** Technical Report Writing 3
- **ENGR 266** Computer Programming for Engineers 3

**Total** 16

**Junior Year—Fall**
- **MFG 313** Manufacturing Analysis and Planning 3
- **MFG 341** Numeric Control Programming 3
- **MET 360** Materials II 3

**Total** 15

**Junior Year—Winter**
- **MET 375** Solid Modeling 3
- **MFG 334** Design of Manufacturing Tooling 3
- **SPE 321** Small Group and Team Communication Business/IMGT restricted elective 3

**Total** 15

**Senior Year—Fall**
- **ANTH 452** Globalization 3
- **MFG 453** Automation and Robotics in Manufacturing 3
- **MFG 461** Senior Project I 3
- **WRI 321** Advanced Technical Communication 1

**Total** 16

**Senior Year—Winter**
- **MFG 462** Senior Project II 3
- **WRI 322** Advanced Technical Communication 1

**Total** 16

**University Departments**

**Accreditation**
The Bachelor of Science in Manufacturing Engineering Technology is accredited by the Technology Accreditation Commission (TAC) of the Accreditation Board for Engineering and Technology (ABET), 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.

**Degree Requirements—Master of Science**
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

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 adviser to complete an academic plan.

**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 adviser for specific details as to which courses qualify as manufacturing electives.

### Bachelor of Science in Manufacturing Engineering Technology

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

**Freshman Year—Fall**
- **MATH 111** College Algebra 4
- **MET 111** Orientation I 2
- **WRI 121** English Composition 3

**Total** 15

**Freshman Year—Winter**
- **CHE 101** Elementary Chemistry 3
- **CHE 104** Elementary Chemistry Laboratory 1
- **MATH 112** Trigonometry 4
- **MFG 120** Manufacturing Processes I 4
- **WRI 122** English Composition 3

**Total** 17

**Freshman Year—Spring**
- **MATH 251** Differential Calculus 4
- **MFG 103** Introductory Welding Processes 3
- **MET 241** CAD for Mechanical Design I 2
- **SPE 111** Fundamentals of Speech 3

**Total** 15

**Sophomore Year—Fall**
- **ENGR 211** Statics ** 4
- **MATH 252** Integral Calculus 4
- **MFG 314** Geometric Dimensioning and Tolerancing 3
- **PHY 201/221** General Physics 4
- **MET 242** CAD for Mechanical Design II 2

**Total** 17

**Sophomore Year—Winter**
- **ENGR 213** Strength of Materials ** 4
- **MATH 361** Statistical Methods I 4
- **MFG 112** Introduction to Manufacturing Processes 3
- **PHY 202/222** General Physics 4

**Total** 15

**Sophomore Year—Spring**
- **ENGR 236** Fundamentals of Electric Circuits 3
- **MATH 362** Statistical Methods II 4
- **MET 160** Materials I 3
- **WRI 227** Technical Report Writing 3
- **ENGR 266** Computer Programming for Engineers 3

**Total** 16

**Junior Year—Fall**
- **MFG 313** Manufacturing Analysis and Planning 3
- **MFG 341** Numeric Control Programming 3
- **MET 360** Materials II 3

**Total** 15

**Junior Year—Winter**
- **MET 375** Solid Modeling 3
- **MFG 334** Design of Manufacturing Tooling 3
- **SPE 321** Small Group and Team Communication Business/IMGT restricted elective 3

**Total** 15

**Senior Year—Fall**
- **ANTH 452** Globalization 3
- **MFG 453** Automation and Robotics in Manufacturing 3
- **MFG 461** Senior Project I 3
- **WRI 321** Advanced Technical Communication 1

**Total** 16

**Senior Year—Winter**
- **MFG 462** Senior Project II 3
- **WRI 322** Advanced Technical Communication 1

**Total** 16
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<th>Senior Year</th>
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</thead>
<tbody>
<tr>
<td>ENGT 415</td>
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<tr>
<td>MFG 428</td>
<td>Manufacturing Engineering Certification 1</td>
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<td>MFG 447</td>
<td>Lean Manufacturing 3</td>
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<td>MFG 463</td>
<td>Senior Project III 3</td>
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<td>WRI 323</td>
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<td>Manufacturing elective ****</td>
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<tr>
<td>Total</td>
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</table>

* Humanities/Social Science requirements: 9 credits of Humanities electives and 9 credits of Social Science electives. ANTH 452 Globalization counts as 3 Social Science credits.
** ENGT 230, ENGT 231, ENGT 232 sequence may be substituted for the ENGR 211, ENGR 213 sequence.
*** Engineering Science elective: complete one of the following courses: Dynamics (ENGR 212), Fluid Mechanics (MET 218), or Thermodynamics (ENGR 355).
**** Manufacturing electives: selected Manufacturing and /or Mechanical Engineering Technology courses. Consult with your adviser for a list of approved courses.
***** Business/Management restricted elective: complete one of the following courses: BUS 304, BUS 305, BUS 355, BUS 355, MGT 321, IMGT 336, or IMGT 482.

### 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.

<table>
<thead>
<tr>
<th>Fall</th>
<th>Spring</th>
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<tbody>
<tr>
<td>MFG 313</td>
<td>MFG 112 Introduction to Manufacturing Processes** 3</td>
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<tr>
<td>MFG 341</td>
<td>MFG 333 Statistical Methods for Quality Improvement 3</td>
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<tr>
<td>MFG 453</td>
<td>MFG 342 Computer Aided Machining 3</td>
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<tr>
<td>BUS/IMGMT</td>
<td>MFG 343 Manufacturing Tool Design 3</td>
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<td>Restricted elective*</td>
<td>BUS/IMGMT Restricted elective* 3</td>
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<td>Manufacturing elective * 3</td>
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<tr>
<td>Total</td>
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</table>

* Restricted elective from the following courses: BUS 304, BUS 305, BUS 355, MGT 321, IMGT 336 or IMGT 482.
** This course is already required for the BSMET degree.
*** 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.

### 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, mechatronics, thermal/fluids/heat transfer, and mechanical design. 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 students 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.

### 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 within five years of graduation. The Program Educational Objectives of OIT’s Mechanical Engineering Program state alumni will:

- be able to analyze, design and improve practical thermal and mechanical systems.
- communicate effectively and work well on team-based engineering projects.
- succeed in entry-level mechanical engineering positions regionally and nationally.
- pursue continued professional development, including professional registration if desired.
- have the skills and knowledge to pursue engineering graduate studies and research, if desired.
### 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.

### 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 have the opportunity to participate in the state-wide MECOP internship program. For information, see the following Web site: http://mecop.ous.edu.

### 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.

### Bachelor of Science in Mechanical Engineering

#### Curriculum

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

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<tr>
<th>Freshman Year</th>
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<tbody>
<tr>
<td>CHE 222</td>
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<tr>
<td>MET 112</td>
<td>Orientation II</td>
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<td>MFG 103</td>
<td>Introductory Welding Processes</td>
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<td>WRI 122</td>
<td>English Composition</td>
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<thead>
<tr>
<th>Freshman Year</th>
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<tr>
<td>MATH 251</td>
<td>Differential Calculus</td>
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<td>MFG 120</td>
<td>Manufacturing Processes I</td>
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<td>MET 160</td>
<td>Materials I</td>
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<td>CAD for Mechanical Design I</td>
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<td>SPE 111</td>
<td>Fundamentals of Speech</td>
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<table>
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<tr>
<th>Sophomore Year</th>
<th>Fall</th>
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<tbody>
<tr>
<td>MATH 252</td>
<td>Integral Calculus</td>
</tr>
<tr>
<td>MFG 242</td>
<td>CAD for Mechanical Design II</td>
</tr>
<tr>
<td>PHY 221</td>
<td>General Physics with Calculus</td>
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<td>WRI 227</td>
<td>Technical Report Writing</td>
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<tr>
<td><strong>Total</strong></td>
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<tr>
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<tbody>
<tr>
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<td>Statics</td>
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<td>MATH 254N</td>
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<td>MATH 361</td>
<td>Statistical Methods I</td>
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<td>or</td>
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<tr>
<td>MATH 465</td>
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<tr>
<td>PHY 222</td>
<td>General Physics with Calculus</td>
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<thead>
<tr>
<th>Sophomore Year</th>
<th>Spring</th>
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<tbody>
<tr>
<td>ENGR 266</td>
<td>Computer Programming for Engineers</td>
</tr>
<tr>
<td>ENGR 213</td>
<td>Strength of Materials</td>
</tr>
<tr>
<td>ENGR 236</td>
<td>Fundamentals of Electrical Circuits</td>
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<tr>
<td>MATH 321</td>
<td>Applied Differential Equations I</td>
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<td>PHY 223</td>
<td>General Physics with Calculus</td>
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<table>
<thead>
<tr>
<th>Junior Year</th>
<th>Fall</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 341</td>
<td>Linear Algebra I</td>
</tr>
<tr>
<td>MFG 314</td>
<td>Geometric Dimensioning and Tolerancing</td>
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<tr>
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<tbody>
<tr>
<td>ENGR 212</td>
<td>Dynamics</td>
</tr>
<tr>
<td>ENGR 355</td>
<td>Thermodynamics</td>
</tr>
<tr>
<td>MECH 315</td>
<td>Machine Design I</td>
</tr>
<tr>
<td>MECH 360</td>
<td>Materials II</td>
</tr>
<tr>
<td>MFG 326</td>
<td>Electrical Power Systems</td>
</tr>
<tr>
<td>SPE 321</td>
<td>Small Group and Team Communication</td>
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<tr>
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<table>
<thead>
<tr>
<th>Junior Year</th>
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<tbody>
<tr>
<td>HUM 125</td>
<td>Introduction to Technology, Society and Values</td>
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<tr>
<td>MATH 451</td>
<td>Numerical Methods I</td>
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<tr>
<td>MECH 312</td>
<td>Dynamics II</td>
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<tr>
<td>MECH 313</td>
<td>Thermodynamics II</td>
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<tr>
<td>MECH 316</td>
<td>Machine Design II</td>
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</tbody>
</table>

### 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 the skills and knowledge for successful careers in mechanical engineering and manufacturing.

#### Program Educational Objectives

Program educational objectives are broad statements that describe the career and professional accomplishments that the program is preparing alumni to achieve.
within five years of graduation. The Program Educational Objectives of OIT’s Mechanical Engineering Technology Program are to produce alumni who:

- are able to analyze and design practical mechanical systems.
- communicate effectively and work well on team-based engineering projects.
- succeed in entry-level mechanical and manufacturing engineering positions.
- pursue continued professional development.
- pursue engineering technology graduate studies, if desired.

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 OIT 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.

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 have the opportunity to participate in the state-wide MECOP internship program. For information, see the following Web site: http://mecop.ous.edu.

Accreditation
The Mechanical Engineering Technology Program is accredited by the Technology Accreditation Commission (TAC) of the Accreditation Board for Engineering and Technology (ABET), 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.

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.

Bachelor of Science in Mechanical Engineering Technology

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

<p>| Freshman Year | Fall | CHE 101/201 Chemistry | 3 |
| Freshman Year | Winter | MATH 111 College Algebra | 4 |
| Freshman Year | Spring | MET 111 Orientation I | 2 |
| Freshman Year | Summer | WRI 121 English Composition | 3 |
| Sophomore Year | Fall | CHE 104/204 Chemistry Laboratory | 1 |
| Sophomore Year | Winter | MATH 112 Trigonometry | 4 |
| Sophomore Year | Spring | MET 112 Orientation II | 2 |
| Sophomore Year | Summer | MFG 103 Introductory Welding Processes | 3 |
| Junior Year | Fall | WRI 122 English Composition | 3 |
| Junior Year | Winter | WRI 227 Technical Report Writing | 3 |
| Sophomore Year | Fall | MATH 251 Integral Calculus | 4 |
| Sophomore Year | Winter | MET 160 Materials I | 3 |
| Sophomore Year | Spring | MET 241 CAD for Mechanical Design I | 2 |
| Sophomore Year | Summer | PHY 201/221 General Physics | 4 |
| Junior Year | Fall | ENGR 211 Statics** | 4 |
| Junior Year | Winter | MATH 254N Vector Calculus I | 4 |
| Junior Year | Spring | MET 242 CAD for Mechanical Design II | 2 |
| Junior Year | Summer | MFG 112 Introduction to Manufacturing Processes | 3 |
| Senior Year | Fall | PHY 202/222 General Physics | 4 |
| Senior Year | Winter | ENGR 213 Strength of Materials** | 4 |
| Senior Year | Spring | MATH 361 Statistical Methods I | 4 |
| Senior Year | Summer | MET 218 Fluid Mechanics | 4 |
| Senior Year | Fall | PHY 203/223 General Physics | 4 |
| Senior Year | Winter | ENGR 236 Fundamentals of Electric Circuits | 3 |
| Senior Year | Spring | ENGR 266 Computer Programming for Engineers | 3 |
| Senior Year | Summer | MET 315 Machine Design I | 3 |
| Senior Year | Fall | MET 360 Materials II | 3 |
| Senior Year | Winter | MET 363 Instrumentation | 3 |
| Senior Year | Spring | Total | 16 |
| Senior Year | Summer | Total | 17 |
| Senior Year | Fall | Total | 16 |
| Senior Year | Winter | Total | 15 |</p>
<table>
<thead>
<tr>
<th>Junior Year</th>
<th>Winter</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGR 212</td>
<td>Dynamics</td>
</tr>
<tr>
<td>ENGR 355</td>
<td>Thermodynamics***</td>
</tr>
<tr>
<td>MET 316</td>
<td>Machine Design II</td>
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<tr>
<td>MET 375</td>
<td>Solid Modeling</td>
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<tr>
<td></td>
<td>Social Science elective</td>
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<table>
<thead>
<tr>
<th>Junior Year</th>
<th>Spring</th>
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</thead>
<tbody>
<tr>
<td>MET 313</td>
<td>Applied Thermodynamics</td>
</tr>
<tr>
<td>MET 415</td>
<td>Design Project</td>
</tr>
<tr>
<td>MET 351</td>
<td>Finite Element Analysis</td>
</tr>
<tr>
<td>MFG 314</td>
<td>Geometric Dimensioning and Tolerancing</td>
</tr>
<tr>
<td></td>
<td>Humanities elective</td>
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<tr>
<td><strong>Total</strong></td>
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<table>
<thead>
<tr>
<th>Senior Year</th>
<th>Fall</th>
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<tbody>
<tr>
<td>MGT 345</td>
<td>Engineering Economy</td>
</tr>
<tr>
<td>MET 323</td>
<td>Heat Transfer I</td>
</tr>
<tr>
<td>MET 326</td>
<td>Electric Power Systems</td>
</tr>
<tr>
<td>MET 490</td>
<td>Senior Projects I</td>
</tr>
<tr>
<td>WRI 321</td>
<td>Advanced Technical Communication</td>
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<td></td>
<td>MET elective</td>
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<td><strong>Total</strong></td>
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<table>
<thead>
<tr>
<th>Senior Year</th>
<th>Winter</th>
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<tbody>
<tr>
<td>MET 426</td>
<td>Fluid Power Systems</td>
</tr>
<tr>
<td>MET 437</td>
<td>Heat Transfer II</td>
</tr>
<tr>
<td>MET 491</td>
<td>Senior Projects II</td>
</tr>
<tr>
<td>SPE 321</td>
<td>Small Group and Team Communication</td>
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<tr>
<td>WRI 322</td>
<td>Advanced Technical Communication</td>
</tr>
<tr>
<td></td>
<td>MET elective</td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>15</strong></td>
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</table>

<table>
<thead>
<tr>
<th>Senior Year</th>
<th>Spring</th>
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</thead>
<tbody>
<tr>
<td>MET 492</td>
<td>Senior Projects III</td>
</tr>
<tr>
<td>MFG 331</td>
<td>Industrial Controls</td>
</tr>
<tr>
<td>WRI 323</td>
<td>Advanced Technical Communication</td>
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<tr>
<td></td>
<td>Engineering Exam****</td>
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<td></td>
<td>Humanities elective</td>
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<td>MET electives 6</td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>17</strong></td>
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</table>

* PSY 201 Recommended
** ENGT 230, ENGT 231, ENGT 232 sequence may be substituted for the ENG 211, ENGR 213 sequence
*** MET 232 Thermodynamics may be substituted for ENGR 355 Thermodynamics
**** Engineering Exam to be selected from:
  • ENGR 485 Fundamentals of Engineering Exam
  • MFG 428 Manufacturing Engineering Certification
Mathematics Department

Tim Thompson, Department Chair
Jim Ballard, Scheduling Coordinator

Professors: B. Cornelius, P. Francis, T. Thompson

Associate Professors: J. Fischer, G. Waterman

Assistant Professors: J. Ballard, T. Fogarty, C. Negoita, R. Paul, T. Torres

General Education

Courses offered by the Department of Mathematics are designed to satisfy the needs of majors and nonmajors 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.

Degree Offered

Bachelor of Science in Applied Mathematics

Minor Offered

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 modelling, 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 precalculus, 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.

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 180. 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 OIT course requirements.

Lower-Division Required Courses

(18 credits)

MATH 221 Introduction to Computational Software
MATH 251 - MATH 254N Calculus Sequence

Upper-Division Core Requirements

(38 credits)

MATH 327 Discrete Mathematics
MATH 321-322 Applied Differential Equations I, II
MATH 341 Linear Algebra I
MATH 354 Vector Calculus II
MATH 361 Statistical Methods I
MATH 421 Applied Partial Differential Equations I
MATH 451 Numerical Methods I

Plus two additional courses chosen from:
MATH 422 Applied Partial Differential Equations II
MATH 423 Applied Partial Differential Equations III
MATH 452 Numerical Methods II
MATH 453 Numerical Methods III

Upper-Division Math/Physics Electives

(At least 9 credits)

Students will choose 3 upper-level mathematics or physics courses with the approval of a mathematics adviser. No more than 6 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 adviser. 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, 126, 223 Programming Languages
- CHE 221, 222, 223 General Chemistry
- ENGR 211, 212, 213 Statics, Dynamics, Strength of Materials
- PHY 311, 312, 313 Introduction to Modern Physics

Electives

- CST 313 Computer Software Techniques
- CHE 331, 332, 333 Organic Chemistry
- EET 371 Laplace Transforms and Applications
- ENGR 231 Fluid Dynamics
- ENGR 236 Fundamentals of Electric Circuits
- PSY 361 Industrial Psychology
- RDSC 356 Magnetic Resonance

Notes:

1. Some of the above courses have an additional lab requirement.
2. PHY 221, 222, 223 may not be used as focused electives.
Bachelor of Science in Applied Mathematics

Curriculum

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

Freshman Year Fall
MATH 251 Differential Calculus 4
SPE 111 Fundamentals of Speech 3
WRI 121 English Composition 3
Social Science elective 3
Elective 3
Total 16

Freshman Year Winter
MATH 252 Integral Calculus 4
MATH 221 Introduction to Computational Software 2
PHY 221 General Physics with Calculus 4
WRI 122 English Composition 3
Social Science elective 3
Total 16

Freshman Year Spring
MATH 253N Sequences and Series 4
PHY 222 General Physics with Calculus 4
Humanities elective 3
Social Science elective 3
Total 14

Sophomore Year Fall
MATH 254N Vector Calculus I 4
MATH 327 Discrete Mathematics 4
PHY 223 General Physics with Calculus 4
Elective 3
Total 14

Sophomore Year Winter
MATH 341 Linear Algebra I 3
MATH 354 Vector Calculus II 4
Humanities elective 3
Elective 4
Total 14

Sophomore Year Spring
MATH 361 Statistical Methods I 4
Humanities electives 3
Electives 9
Total 16

Junior Year Fall
MATH 321 Applied Differential Equations I 3
SPE 321 Small Group and Team Communication 3
Focused elective 3
Elective (upper-division) 4
Total 13

Junior Year Winter
MATH 322 Applied Differential Equations II 4
WRI 227 Technical Report Writing 3
Focused elective 3
Electives 6
Total 16

Senior Year Fall
MATH 421 Applied Partial Differential Equations I 4
Focused elective 3
Math/Physics elective ** 3
Elective 3
Total 15

Senior Year Winter
MATH Mathematics Core (upper-division) *** 4
WRI 327 Advanced Technical Writing 3
Math/Physics elective ** 3
Elective 3
Total 16

Senior Year Spring
MATH Mathematics Core (upper-division) *** 4
Focused elective 3
Math/Physics elective ** 3
Elective 3
Total 13

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

1. Required courses: MATH 251, MATH 252, MATH 253N, MATH 254N and MATH 341, plus 10 additional upper-division mathematics credits selected from the list below.
2. A passing grade in all courses and a cumulative GPA of 2.0 or better is required to be awarded the minor.
3. At least 12 credits must be taken at OIT.

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

Upper-Division Electives:

MATH 311 Introduction to Real Analysis
MATH 321 Applied Differential Equations I
MATH 322 Applied Differential Equations II
MATH 327 Discrete Mathematics
MATH 342 Linear Algebra II
MATH 346 Number Theory
MATH 347 Fundamentals of Abstract Algebra
MATH 354 Vector Calculus II
MATH 362 Statistical Methods II
MATH 421 Applied Partial Differential Equations I
MATH 422 Applied Partial Differential Equations II
MATH 423 Applied Partial Differential Equations III
MATH 425 Vector Analysis
MATH 451 Numerical Methods I
MATH 452 Numerical Methods II
MATH 453 Numerical Methods III
MATH 465 Mathematical Statistics

Note: Not all courses are offered every term or every year.
Medical Imaging Technology Department

LeAnn Maupin, Department Chair

Jenny Kellstrom, Radiologic Science Program Director and Clinical Coordinator

Cheryl Zelinsky, Diagnostic Medical Sonography Program Director

LeAnn Maupin, Vascular Technology Program Director

Janette Isaacson, Vascular Technology and Echocardiography Degree Completion Program Director

Chris Caster, Vascular Technology Clinical Coordinator, Assessment Coordinator

Richard Hoylman, Nuclear Medicine Technology Program Director and Clinical Coordinator

Robyn Cole, Diagnostic Medical Sonography Clinical Coordinator

Debbie Caldwell, Medical Imaging Advising Coordinator

Professor: J. Kellstrom, S. Schultz, G. Zimmerman

Associate Professors: D. Caldwell, C. Caster, T. McVay, L. Maupin, C. Zelinsky

Assistant Professors: J. Broker, R. Cole, R. Hoylman

Instructors: V. Bennett, R. Carson, T. Graham, D. McDonnell, S. Templeton

Participating Faculty: J. Isaacson (Distance Education)

Degrees Offered

Bachelor of Science in Diagnostic Medical Sonography
Bachelor of Science in Echocardiography
Bachelor of Science in Nuclear Medicine Technology

Bachelor of Science in Radiologic Science
Bachelor of Science in Vascular Technology

Specialization Offered

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 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.

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 conduct patient interviews, compile health histories and determine risk assessments pertaining to cardiovascular disease. The echocardiographer reports pertinent findings to the physician as part of the diagnostic process.

Nuclear Medicine Technology:

Nuclear medicine is an imaging science that demonstrates pathology through physiologic processes, as opposed to detailed anatomic images. This branch of imaging science has been in existence for over four decades, and provides unique diagnostic information obtained by the patient’s ingestion, inhalation, or being injected with a radioactive isotope.

Radiologic Science:

This program has been in existence at OIT 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.

Facilities
OIT’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 OIT campus during this year.

All imaging students must have a current American Heart CPR card during the entire extern year. The imaging department will provide an opportunity for the student to receive this certification during the junior year. There is an additional fee for this certification.

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 will be required to pass a drug test prior to acceptance by the externship site.
3. Students must complete a request for criminal history which is required by many of the sites for persons providing care to children or the developmentally disabled.
4. Students will be required to carry group health insurance coverage during the entire externship year.

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 OIT Pre-MIT Program does not mean the student has been accepted into a specific MIT program.

Program Selection Criteria
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 2.75 weighted GPA (though a 3.0 is highly recommended), in the following courses (or equivalent transfer courses) to apply to one of the five MIT Programs.

<table>
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<tr>
<th>Course</th>
<th>Credits</th>
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<tbody>
<tr>
<td>BIO 200: Medical Terminology</td>
<td>2</td>
</tr>
<tr>
<td>BIO 231: Human Anatomy and Physiology I</td>
<td>4</td>
</tr>
<tr>
<td>BIO 232: Human Anatomy and Physiology II</td>
<td>4</td>
</tr>
<tr>
<td>BIO 233: Human Anatomy and Physiology III</td>
<td>4</td>
</tr>
<tr>
<td>CHE 101: Elementary Chemistry</td>
<td>3</td>
</tr>
<tr>
<td>CHE 104: Elementary Chemistry</td>
<td>3</td>
</tr>
<tr>
<td>MATH 112: Trigonometry</td>
<td>4</td>
</tr>
<tr>
<td>MIT 103: Introduction to Medical Imaging</td>
<td>3</td>
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</tbody>
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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 OIT hosted selection event on a specific date during spring term. Several activities are conducted during this event to allow students to demonstrate communication skills, team skills, writing skills, problem solving skills and professionalism. Faculty from the MIT Department, industry leaders and other OIT department members are present at the selection event to evaluate those skills.

Application Requirements
Applications are available through MIT 103 Introduction to Medical Imaging.

A copy of transcripts (unofficial) must be attached to the application. Incomplete applications will not be accepted. There are no refunds of the application fee. Repeat applicants must follow the same procedures as first-time applicants. Contact the selection chairman for a new application.

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.

For current selection information refer to the OIT Medical Imaging Technology (MIT) Web site at www.oit.edu/mit.

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 Introduction to Medical 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 form is included in the MIT 103 course. Transfer students must apply to both OIT and MIT using two separate application processes. For more information on this distance course, contact Diana Evans at (541) 885-1676.

Graduation Requirements
All credits listed in the curriculum for the catalog year a student begins a program must be fulfilled. Total credits required for graduation are: Diagnostic Medical Sonography 193, Echocardiography 198, Nuclear Medicine Technology 195, Radiologic Science 202 and Vascular Technology 199.

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, VT), 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 a professional program as a sophomore.

When a student unsuccessfully attempts an imaging course, progress in the professional curriculum is curtailed until that course is successfully completed the following year, pending reinstatement. However, if the student has an unsuccessful attempt fall term, sophomore year, they must reapply to the program. If the student has an unsuccessful attempt after 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 letter must be submitted at least one term prior to readmittance. Readmittance may also depend upon other requirements such as auditing courses, attending labs, and/or remedial work as specified by the program director.

When students attempt unsuccessfully a second time the same or a different imaging course, they are terminated from that program. Additionally, if a student receives a “D,” “F” or “W” in two or more imaging courses in one term, they will be dismissed from that program.

Students may apply for admittance to a second imaging program under the same application criteria as all other applicants. After two unsuccessful attempts to complete two different programs, students 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.

Bachelor of Science in Diagnostic Medical Sonography

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

Pre-Medical Imaging Technology

Freshman Year Fall
BIO 231 Human Anatomy and Physiology I 4
CHE 101 Elementary Chemistry 3
CHE 104 Elementary Chemistry Laboratory 1
MATH 111 College Algebra 4
MIT 103 Introduction to Medical Imaging 3
Total 15

Freshman Year Winter
BIO 232 Human Anatomy and Physiology II 4
MATH 112 Trigonometry 4
WRI 121 English Composition 3
Humanities elective 3
Social Science elective 3
Total 17

Freshman Year Spring
BIO 200 Medical Terminology 2
BIO 233 Human Anatomy and Physiology III 4
PSY Psychology (PSY 201, PSY 202 or PSY 203) 3
SPE 111 Fundamentals of Speech 3
WRI 122 English Composition 3
Total 15

Professional Courses
Sophomore Year Fall
BIO 355 Cross-Sectional Anatomy 3
DMS 205* Applications of Abdominal Sonography 3
DMS 231* Sonographic Physics and Instrumentation I 3
DMS 252* Sophomore Laboratory I 1
PHY 217 Physics of Medical Imaging 3
Total 13

Sophomore Year Winter
DMS 224* Sonographic Abdominal Scanning I 3
DMS 232* Sonographic Physics and Instrumentation II 3
DMS 253* Sophomore Laboratory II 1
WRI 227 Technical Report Writing 3
Humanities elective 3
Social Science elective 3
Total 16

Sophomore Year Spring
DMS 225* Sonographic Abdominal Scanning II 3
DMS 254* Sophomore Laboratory III 1
DMS 255* Sonographic Film Analysis 3
Humanities elective 3
Social Science elective 3
Total 13

Junior Year Fall
BUS 317 Health Care Management 3
DMS 333* Pelvic Sonography 3
DMS 335* Diagnostic Medical Sonography Patient Care 3
DMS 352* Junior Laboratory I 1
SPE 321 Small Group and Team Communication 3
Social Science elective 3
Total 16

Junior Year Winter
BUS 316 Total Quality in Health Care 3
DMS 316* Survey of Vascular Technology 3
DMS 334* Obstetrical Sonography I 3
DMS 337* Breast Sonography 3
DMS 353* Junior Laboratory II 1
Math/Science/Social Science elective 3
Total 16

Junior Year Spring
DMS 343* Fetal Echo and Neonatal Sonography 3
DMS 344* Obstetrical Sonography II 3
DMS 354* Junior Laboratory III 1
DMS 365* Sonographic Pathology 3
DMS 388* Externship Preparation 2
Total 12

Senior Year Summer
DMS 430* Diagnostic Medical Sonography Externship 15
Total 15

Senior Year Fall
DMS 430* Diagnostic Medical Sonography Externship 15
Total 15

Senior Year Winter
DMS 430* Diagnostic Medical Sonography Externship 15
Total 15

Senior Year Spring
DMS 430* Diagnostic Medical Sonography Externship 15
Total 15

* Core Imaging Courses
** Courses listed under Communication requirements for General Education.
### Bachelor of Science in Echocardiography

#### Curriculum

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

#### Pre-Medical Imaging Technology

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### Bachelor of Science in Nuclear Medicine Technology

#### Curriculum

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

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*Courses listed under Communication requirements for General Education.

#### Professional Courses

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* University Departments

**Total 16**
### Bachelor of Science in Radiologic Science

#### Curriculum

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

#### Pre-Medical Imaging Technology

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#### Professional Courses

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#### Bachelor of Science in Vascular Technology

#### Curriculum

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

#### Pre-Medical Imaging Technology

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</table>

### Oregon Institute of Technology
field. These programs are fully online. There is no requirement to come to campus.

**Bachelor's Degree Completion Echocardiography**

**Admission Requirements**
1. Complete the Online Degree Completion Program Application for Admission.
2. Mail your application, a copy of your registry certificate, and a check for $100 (made out to Oregon Institute of Technology) to the Distance Education Office.
3. Mail official transcripts from all colleges you have attended to the Distance Education Office.
4. Request a letter of good standing from ARDMS/CCI be mailed to the Distance Education Office.

**Courses granted for Registry**

**BIO 220** Cardiac Physiology 4  
**BIO 346** Pathophysiology I 3  
**BIO 347** Pathophysiology II 3  
**ECHO 225** Cardiopulmonary Patient Management Practices 3  
**ECHO 231** Echocardiography I 4  
**ECHO 232** Echocardiography II 4  
**ECHO 320** Cardiographic Methods 4  
**ECHO 321** Stress and Treadmill Echo 3  
**ECHO 333** Echocardiography III 4  
**ECHO 420** Echocardiography Externship 45  
**MIT 103** Introduction to Medical Imaging 3  
**PHY 217** Physics of Medical Imaging 3  
**VAS 210** Vascular Physical Principles and Instrumentation I 4  
**VAS 211** Vascular Physical Principles and Instrumentation II 4

**OIT Degree Completion Courses**

**BUS 316** Total Quality in Health Care 3  
**BUS 317** Health Care Management 3  
**CHE 210** Clinical Pharmacology 3  
**ECHO 325** Pediatric Echocardiography 3  
**ECHO 332** Invasive Cardiology 3  
**ECHO 334** Echocardiography IV 4  
**ECHO 365** Abdominal/Renal Testing 4  
**ECHO 376** Survey of Vascular Testing* 3  
**ECHO 385** Echocardiography Laboratory Management 3  
**ECHO 420A** Echocardiography Externship 8  
**ECHO 420B** Echocardiography Externship 7  
**ECHO 421** Echo Senior Project 4  
**SPE 321** Small Group and Team Communication 3  
**SPE 325** Group Communication elective 3

* Optional credits may be awarded for additional registries.

**Bachelor’s Degree Completion Radiologic Science**

**Admission Requirements**
1. Complete the Radiologic Science Online Degree Completion Program Application for Admission and the Statement of Acknowledgement.
2. Mail your application, an unofficial copy of your AART registry card, Statement of Acknowledgement, and a check for $100 (made out to Oregon Institute of Technology) to the Distance Education Office. A copy of your AART card must accompany your application for OIT to begin processing the application. This document verifies your eligibility for admission to the program.
3. Request that official transcripts from all colleges you have attended and an official copy of your AART registry documents be sent to the Distance Education Office. Official copies will enable OIT to grant college credit based on your credentials.

**Courses granted for Registry**

**CHE 210** Introduction to Medical Imaging 3  
**PHY 217** Physics of Medical Imaging 3  
**RDSC 201** Imaging Techniques I 4  
**RDSC 202** Imaging Techniques II 4  
**RDSC 205** Patient Care 4  
**RDSC 210** Radiographic Positioning I 4  
**RDSC 211** Radiographic Positioning II 4  
**RDSC 233** Contrast Media Procedures 4  
**RDSC 235** Equipment Operation and Maintenance 3  
**RDSC 272** Radiation Protection 3
RDSC 301  Radiographic Positioning III  4
RDSC 320  Surgical, Trauma and Mobile Radiography  4
RDSC 410  Radiologic Science Externship  45

**OIT Degree Completion Courses**

BIO 335  Cross-Sectional Anatomy  3
BIO 336  Essentials of Pathophysiology  3
BUS 316  Total Quality in Health Care  3
BUS 317  Health Care Management  3
RDSC 326  Cardiovascular/Interventional Technology*  4
RDSC 354  Mamnography*  3
RDSC 355  Computed Tomography  3
RDSC 356  Magnetic Resonance  4
RDSC 366  Radiologic Pathology  3
RDSC 411  Special Radiologic Science Externship  15
SPE 321  Small Group and Team Communication  3

or

RDSC 365  Advanced Quality Assurance/Quality Control  4

SPE 321  Small Group and Team Communication  3

* Optional credit may be awarded for additional registries.

**Transfer Courses**

BIO 200  Medical Terminology  2
BIO 231  Human Anatomy and Physiology I  4
BIO 232  Human Anatomy and Physiology II  4
BIO 233  Human Anatomy and Physiology III  4
CHE 101  Elementary Chemistry  3
CHE 104  Elementary Chemistry Laboratory  1
MATH 111  College Algebra  4
MATH 112  Trigonometry  4
PSY 321  Psychology (PSY 201, PSY 202 or PSY 203)  3
SPE 111  Fundamentals of Speech  3
WRI 121  English Composition  3
WRI 122  English Composition  3
WRI 227  Technical Report Writing  3

Bachelor’s Degree Completion Vascular Technology

**Admission Requirements**

1. Complete the Online Degree Completion Program Application for Admission.
2. Mail your application, a copy of your registry certificate, and a check for $100 (made out to Oregon Institute of Technology) to the Distance Education Office.
3. Request that official transcripts from all colleges you have attended to be sent to the Distance Education Office.
4. Request a letter of good standing from ARDMS/CCI be mailed to the Distance Education Office. This letter will enable the Registrar to grant college credit based on your registry.

**Courses granted for Registry**

BIO 346  Pathophysiology I  3
BIO 347  Pathophysiology II  3
MIT 105  Introduction to Medical Imaging  3
PHY 217  Physics of Medical Imaging  3
VAS 210  Vascular Physical Principles and Instrumentation I  4
VAS 211  Vascular Physical Principles and Instrumentation II  4
VAS 214  Vascular Anatomy  4
VAS 225  Patient Management Practices  3
VAS 245  Peripheral Venous Disease  4
VAS 246  Peripheral Arterial Disease  4
VAS 367  Cerebrovascular Disease  4
VAS 420  Vascular Technology Externship  45

**OIT Degree Completion Credits**

BIO 220  Cardiovascular Physiology  4
BUS 316  Total Quality in Health Care  3
BUS 317  Health Care Management  3
CHE 210  Clinical Pharmacology  3
SPE 321  Small Group and Team Communication  3

or

VAS 335  Radiographic Vascular Anatomy  3
VAS 337  Survey of Echocardiography  3
VAS 365  Abdominal Vascular Disease  4
VAS 366  Special Circulatory Problems  4
VAS 375  Survey of Abdominal Sonography*  3
VAS 385  Vascular Laboratory Management  3
VAS 420A  Special Vascular Technology Externship  8
VAS 420B  Special Vascular Technology Externship  7

HUMANITIES ELECTIVES  9
SOCIAL SCIENCE ELECTIVES  9
ELECTIVE  2

* Optional credit may be awarded for additional registries.

**Transfer Courses**

BIO 200  Medical Terminology  2
BIO 231  Human Anatomy and Physiology I  4
BIO 232  Human Anatomy and Physiology II  4
BIO 233  Human Anatomy and Physiology III  4
CHE 101  Elementary Chemistry  3
CHE 104  Elementary Chemistry Laboratory  1
MATH 111  College Algebra  4
MATH 112  Trigonometry  4
PSY 321  Psychology (PSY 201, PSY 202 or PSY 203)  3
SPE 111  Fundamentals of Speech  3
WRI 121  English Composition  3
WRI 122  English Composition  3
WRI 227  Technical Report Writing  3
HUMANITIES ELECTIVES  9
SOCIAL SCIENCE ELECTIVES  9
ELECTIVE  2
Military Science

Office: Owens Hall, 216F

Professor: Major Travis Lee

Instructors: Captain Michael Whalen, First Lieutenant Matt Cofer, and Sergeant First Class Lee Blank

Recruiting/Retention Sergeant: Major Kirk Mickelsen

The 186th Guard Officer Leadership Detachment (GOLD) is a regular instructional division of the university. The Military Science Department offers four years of upper and lower division military science courses to all students who meet course prerequisites. The courses are fully accredited and applicable as electives for fulfilling baccalaureate degree requirements. Successful completion of the GOLD Program leads to commissioning as a federally recognized, Second Lieutenant in the Oregon Army National Guard. The course is broken into two phases, a Basic Course and an Advanced Course. Participation in both phases is voluntary and requires no military commitment.

Basic Course/Introduction Phase

The Basic Course is composed of 100 and 200-level lower-division courses. It is usually taken during the freshman and sophomore years and is open to any student enrolled at OIT. Instruction is oriented toward outdoor training and classroom activities that give students insight into military service, basic soldier skills, and leadership.

Advanced Course/Pre-commissioning Phase

The Advanced Course is a two year pre-commissioning phase integrating classroom instruction, military training, and practical experience to progressively develop leadership skills, qualities, and character. Following the sophomore and junior years, students who are Army National Guardsmen and have formally enrolled in the GOLD Program attend two intensive two week training exercises. Upon successful completion of the second two week training exercise, students graduate from the program and are eligible to receive a commission as Second Lieutenants. Although participation in the Basic Course is not a prerequisite for the Advanced Course, it is strongly encouraged.

Eligibility

All students are eligible to attend and participate in any Military Science (MSC) classes. In order to be formally accepted into the GOLD Program students must be:
- Between 18 and 35 years old.
- A U.S. citizen or willing to apply.
- A member of the Army National Guard.
- In good health and able to meet military entry requirements.
- Of good moral character and behavior.

Educational Benefits

Several educational benefits are available to students once they are formal program members and Army National Guardsmen. These include Federal Tuition assistance, the Montgomery GI Bill, and a $350 per month Commissioning Kicker (stipend) in addition to their monthly pay check from the Army National Guard. Interested students should contact either the Military Science Department or simply call Major Travis Lee at (541) 552-6309.

Commissioning

In addition to the GOLD Program requirements, students must meet all guidelines for a baccalaureate degree if they are seeking a commission. These requirements are outlined in the Baccalaureate Degree Requirements section of the course catalog and include the completion of general education and academic major requirements. When the Advanced Course is successfully completed and students receive their baccalaureate degree, they are commissioned as Second Lieutenants in the Oregon Army National Guard.
Natural Sciences Department

Tanya McVay, Department Chair


Associate Professors: H.-Y. Li, T. McVay, M. O’Shaughnessy, K. Sale, R. Torres, K. Usher

Assistant Professors: A. Amoia, R. Wilde, C. Wittmer

Instructor: R. McClure

Degrees Offered
Bachelor of Science in Biology
Biological Sciences Emphasis
Pre-Medical Professions Emphasis
Bachelor of Science in Environmental Sciences
Bachelor of Science in Health Sciences

Minor Offered
Biology

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 Program

Burton Clark, Program Director for Biology—Pre-Medical Professions Emphasis

Lawrence Powers, Program Director for Biology—Biological Sciences Emphasis


Degree Offered
Bachelor of Science in Biology

Minor Offered
Biology

Objective and Career Opportunities
The Bachelor of Science in Biology provides students with several program alternatives to meet their career objectives. The courses of study are designed to prepare students for entry into professional and graduate careers in the health sciences, environmental sciences, biological sciences and biology education.

A biological sciences curriculum emphasizes field and laboratory training in ecology, evolution, and the biology of organisms. It is designed for students wishing to apply to graduate programs in biology, those seeking careers in the applied biological sciences, and those wishing to pursue graduate teaching credentials with a specialty in biology.

A pre-medical professions curriculum is designed for students wishing to apply to graduate and professional schools in medicine, dentistry, osteopathy, veterinary medicine, physical therapy, occupational therapy, optometry, pharmacy, podiatry, clinical laboratory sciences, and other programs requiring rigorous coursework in the sciences and mathematics.

Considerable flexibility in major electives is granted toward the degree. Students, in consultation with their advisers, may select courses from either curriculum or from courses in other departments that satisfy the degree requirements.

Degree Requirements
The minimum graduation requirement for OIT is 180 credit hours (term hours). A minimum of 60 credits must be in upper-division (300- and 400-numbered) courses. These requirements include those for general education (stated elsewhere in this catalog) and the prescribed courses required for every student completing a Bachelor of Science in Biology degree. Prescribed courses differ for students in the premedical professional and the biological sciences curricula. Note also that these curricula differ slightly from the curriculum offered for the Bachelor of Science degree in Environmental Sciences. Please consult program officials for advising.

Biology 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.

Bachelor of Science in Biology—Biological Sciences Emphasis

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

Freshman Year
Fall
BIO 211 Principles of Biology 4
MATH 111 College Algebra 4
WRI 121 English Composition 3
Social Science elective 3
Total 14

Winter
BIO 212 Principles of Biology 4
GEOG 105 Physical Geography: Geomorphology 3
MATH 112 Trigonometry 4
WRI 122 English Composition 3
Total 14

Spring
BIO 213 Principles of Biology 4
MATH 361 Statistical Methods I 4
SPE 111 Fundamentals of Speech 3
WRI 227 Technical Report Writing 3
Total 14

Sophomore Year
Fall
BIO 345 Medical Microbiology 5
CHE 221 General Chemistry 5
MATH 251 Differential Calculus 4
Social Science elective 3
Total 17
When choosing the major 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.

### General and Major Elective Choices:

- **BIO 112** Introduction to Data Analysis
- **BIO 205** Nutrition
- **BIO 216** Introduction to Veterinary Medicine
- **BIO 225** Riparian Assessment Methods
- **BIO 226** Introduction to Wildlife Rehabilitation
- **BIO 227** Introduction to Forensic Science
- **BIO 231** Human Anatomy and Physiology I
- **BIO 232** Human Anatomy and Physiology II
- **BIO 233** Human Anatomy and Physiology III
- **BIO 331** Human Anatomy and Physiology I
- **BIO 332** Human Anatomy and Physiology II
- **BIO 333** Human Anatomy and Physiology III
- **BIO 337** Aquatic Ecology
- **BIO 346** Pathophysiology I
- **BIO 347** Pathophysiology II
- **BIO 357** Introduction to Neuroscience
- **BIO 428** Animal Behavior
- **BIO 434** Data Analysis Methods
- **BIO 436** Immunology
- **BIO 471** Senior Project Proposal Research
- **BIO 472** Senior Project Proposal
- **BIO 473** Senior Project Data Collection
- **BIO 474** Senior Project Data Analysis and Presentation
- **CHE 210** Clinical Pharmacology
- **CHE 231** Streamwater Chemistry
- **CHE 232** Streamwater Sampling
- **CHE 315** Environmental Chemistry and Toxicology
- **CHE 325** Soil Science
- **GEOG 115** Physical Geography: Climatology
- **GIS 105** Map and Compass/GIS
- **MATH 362** Statistical Methods II

Other Major Electives with adviser approval:

- Students wishing to use Human Anatomy and Physiology should select either the 231-233 or 331-333 sequence. Note credit hour differences and consult with adviser.
- Either BIO 337 or BIO 428 is required for admission to Southern Oregon University’s MAT program.

### Bachelor of Science in Biology—Pre-Medical Professions Emphasis

#### Curriculum

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

**Freshman Year**

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<tr>
<th>Fall</th>
<th>Course</th>
<th>Credits</th>
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<tr>
<td></td>
<td>BIO 211 Principles of Biology</td>
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<td>MATH 111 College Algebra</td>
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**Sophomore Year**

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<td>CHE 222 General Chemistry</td>
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<td>MATH 252 Integral Calculus</td>
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<td>SPE 321 Small Group and Team Communication</td>
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**Junior Year**

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<tr>
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<td>CHE 351 Organic Chemistry I</td>
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<td>PHY 221 General Physics with Calculus</td>
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<tr>
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<td>ANTH 101 Introduction to Physical Anthropology</td>
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<td>BIO 352 Developmental Biology</td>
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<td>CHE 332 Organic Chemistry II</td>
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**Senior Year**

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<td>BIO 313 Botany</td>
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**Sophomore Year**

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**Freshman Year**

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<tr>
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<td>BIO 112 Introduction to Data Analysis</td>
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<td>BIO 205 Nutrition</td>
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<td>BIO 216 Introduction to Veterinary Medicine</td>
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<td>BIO 225 Riparian Assessment Methods</td>
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<td>BIO 226 Introduction to Wildlife Rehabilitation</td>
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<tr>
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<td>BIO 200 Medical Terminology</td>
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<td>BIO 213 Principles of Biology</td>
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<td>MATH 361 Statistical Methods I</td>
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<td>CHE 221 General Chemistry</td>
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<td>MATH 251 Differential Calculus</td>
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<td>WRI 111 Fundamentals of Speech</td>
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<td>BIO 341 Medical Genetics</td>
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<td>SPE 321 Small Group and Team Communication</td>
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<tr>
<td></td>
<td>BIO 421 Principles of Biology</td>
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**Junior Year**

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<tr>
<td></td>
<td>CHE 331 Organic Chemistry I</td>
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<td>BIO 213 Principles of Biology</td>
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<td>MATH 112 Trigonometry</td>
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<tbody>
<tr>
<td></td>
<td>BIO 332 Human Anatomy and Physiology II</td>
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* PHY 201, PHY 202, PHY 203 may be substituted with adviser consent.

** MATH 243 may be substituted with adviser consent.

$ Another social science course may be substituted with adviser consent.

‡ Offered in alternating years.

‡‡ Offered in alternating years, please see course schedule for each term.
Junior Year
BIO 333 Human Anatomy and Physiology III 5
CHE 333 Organic Chemistry III 4
PHY 223 General Physics with Calculus * 4
WRI 327 Advanced Technical Writing 3
Total 16

Senior Year
Fall
BIO 426 Evolutionary Biology 3
CHE 450 Biochemistry I 4
Social Science elective 3
Elective 3
Total 16

Senior Year
Winter
BIO 346 Pathophysiology I 3
BIO 409 Current Research Topics in Medical Sciences II 1
CHE 451 Biochemistry II 4
Social Science elective 3
Elective 3
Total 14

Senior Year
Spring
BIO 436 Immunology 4
CHE 452 Biochemistry III 4
Elective 4
Total 15

General and Major Elective Choices:
BIO 205 Nutrition 3
BUS 215 Principles of Management 3
BUS 306 Principles of Marketing 3
BUS 314 Entrepreneurship 3
BUS 316 Total Quality in Health Care 3
BUS 317 Health Care Management 3
BUS 335 Small Business Management 3
CHE 210 Clinical Pharmacology 3
HSC 485 Research and Project Proposal 3
MATH 362 Statistical Methods II 4
PSY 215 Abnormal Psychology I 3
PSY 216 Abnormal Psychology II 3
PSY 220 Community Psychology 3
PSY 311 Human Growth and Development I 3
PSY 312 Human Growth and Development II 3
PSY 336 Health Psychology I 3
PSY 337 Health Psychology II 3

Other general and major electives with adviser consent.
* PHY 201, PHY 202, PHY 203 may be substituted with adviser consent.
** MATH 243 may be substituted with adviser consent.

Pre-Professional Program in Dentistry
Dr. Molly O’Shaughnessy,
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, anatomy & physiology, and physics. All of these have year-long labs. In addition, health-specific courses in cell biology, medical genetics, medical microbiology, 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 advisers in the pre-med program and it is encouraged that students work closely with the adviser they connect best with. Advisers 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 prepare for future success. It is recommended that students do not use AP credit to fulfill medical school prerequisites since they often do not accept them. Nonetheless, it is encouraged to take
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 OIT includes a full year of general biology, general chemistry, organic chemistry, biochemistry, anatomy & physiology, and physics. All of these have year-long labs. Additional courses in cell biology, medical genetics, medical microbiology, nutrition, pathophysiology, and immunology are taken along with calculus, humanities, psychology, statistics and English composition courses. The pre-professional program in pharmacy at OIT has eight advisers and students are encouraged to work closely with the adviser 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 recommended 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.

Completion of this program will lead to a degree in Biology. For complete program requirements and a list of appropriate courses please see the Bachelor of Science in Biology-Pre-Medical Professions Emphasis.

Pre-Professional Program in Pharmacy

Dr. Molly O’Shaughnessy,
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, anatomy & physiology, and physics. All of these have year-long labs. Additional courses in cell biology, medical genetics, medical microbiology, nutrition, pathophysiology, and immunology are taken along with calculus, humanities, psychology, statistics and English composition courses. The pre-professional program in pharmacy at OIT has eight advisers and students are encouraged to work closely with the adviser 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 recommended 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.

Completion of this program will lead to a degree in Biology. For complete program requirements and a list of appropriate courses please see the Bachelor of Science in Biology-Pre-Medical Professions Emphasis.

Pre-Professional Program in Veterinary Medicine

Dr. Molly O’Shaughnessy,
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 advisers in the program and students should work closely with the adviser 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. Advisers 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 the University of Colorado, Oregon State University, Washington State University and 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, anatomy & physiology, and physics. All of these have year-long labs. In addition, health-specific courses in animal behavior, wildlife rehabilitation, cell biology, medical genetics, medical microbiology, nutrition, pathophysiology, and immunology are taken.
along with calculus, humanities, psychology, English composition and public speaking courses. Business-related courses are also recommended.

Completion of this program will lead to a degree in Biology. For complete program requirements and a list of appropriate courses please see the Bachelor of Science in Biology-Pre-Medical Professions Emphasis.

**Biology Minor**

The biology minor is open to all majors and 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 adviser in the Natural Sciences Department. Contact Kathy Sale for details. 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
- BIO 212 Principles of Biology
- BIO 213 Principles of Biology

And a minimum of 12 credits upper-division course work from the following list:

- BIO 313 Botany*
- BIO 317 Invertebrate Biology
- BIO 327 General Ecology*
- BIO 331 Human Anatomy and Physiology I
- BIO 332 Human Anatomy and Physiology II
- BIO 333 Human Anatomy and Physiology III
- BIO 337 Aquatic Ecology*
- BIO 341 Medical Genetics
- BIO 345 Medical Microbiology
- BIO 351 Vertebrate Biology
- BIO 426 Evolutionary Biology
- BIO 436 Immunology

* Courses offered in alternating years.
Environmental Sciences Program

Carrie Wittmer, Program Director


Degree Offered
Bachelor of Science in Environmental Sciences

The Bachelor of Science degree in Environmental Sciences is a degree in science methodology and applied analysis, focusing on applying state-of-the-art field methods, instrumentation, data analysis and the study of environmental problems. Three technical emphasis areas are available: Watershed Science, Sustainable Technologies and Geographic Information Systems (GIS). The program builds on three cores: an environmental core of six lower-division courses, a basic sciences core consisting of nine courses (one year each of biology, chemistry and physics), and a mathematics core of five courses, including differential and integral calculus and statistics. The program is interdisciplinary in nature and utilizes practical skills and knowledge of faculty from a broad range of backgrounds and experience.

Students may choose to concentrate in one of the technical emphasis areas or, under the direction of an adviser, students may blend offerings from three areas to create a more individually focused curriculum. Courses from other departments including Civil Engineering, Renewable Energy Engineering and Manufacturing and Mechanical Engineering, Mathematics, Chemistry, Health Sciences, Computers, or Communication Studies may be substituted for technical emphasis courses upon approval of your adviser.

Objectives
The objectives of the Environmental Sciences Program are:

1. To provide students with knowledge and training in the practical application of the scientific method utilizing analytical approaches and instrumentation-based methodologies.
2. To prepare students for roles that require critical-thinking and problem-solving skills.
3. To present complex environmental problems from a systems perspective that features diverse data acquisition and manipulation techniques.
4. To allow students to develop team-based problem solving skills by encouraging collaboration, promoting diversity of approaches, and utilizing projects and task-based exercises and assignments.

Student Preparation
The Environmental Sciences curriculum is a demanding instructional program requiring the development and use of quantitative skills. Prospective students for this program are advised to complete two to three years of high school mathematics and science (biology, chemistry, and physics). Students should also be familiar with computer applications. Students transferring from other science or technical programs, including environmental programs at other institutions, are requested to contact the program director for information on program requirements.

Career Opportunities
The Environmental Sciences Program produces graduates who are highly skilled in the methodology and practice of environmental assessment. Students learn to design, implement and interpret the results of scientific studies used to address specific environmental issues and problems. Graduates can expect to find employment in consulting firms, government agencies (regulatory and research), educational institutions and many types of service and industrial firms. Students are also prepared to enter many graduate school programs.

Environmental Science students have been actively recruited by major employers including: U.S. Bureau of Reclamation, Bureau of Land Management, U.S. Fish and Wildlife Service, Oregon State Police Wildlife Enforcement, Klamath County Health Department, Klamath Irrigation District, U.S. Geological Survey, the Nature Conservancy, Klamath County Soil and Water Conservation District and JELD-WEN.

Many Environmental Sciences majors find part time or summer employment directly related to their studies.

Degree Requirements
Students must meet the general education requirements, as stated elsewhere in this catalog, and satisfactorily 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 an area of technical expertise based on their own interests. The sophomore project provides an opportunity for independent investigation early in the student’s academic career. Students prepare the groundwork for their senior project at the end of the junior year in BIO 473 - Senior Project Data Collection. The project culminates in BIO 474 Senior Project Data Analysis and Presentation - in fall of senior year.

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, streamwater chemistry and riparian assessment methods at his/her own pace using customized CD-ROMs. Students typically apply several of these skills to their sophomore and senior projects.
### Bachelor of Science in Environmental Sciences

#### Curriculum

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

| Freshman Year | Fall       | BIO 211 | Principles of Biology | 4 |
|               | GIS 105   | Introduction to GIS | 1 |
|               | BIO 111   | Introduction to Environmental Sciences | 4 |
|               | MATH 111  | College Algebra | 4 |
|               | WRI 121   | English Composition | 3 |
|               | Total     |           | 16 |

| Freshman Year | Winter    | BIO 212 | Principles of Biology | 4 |
|               | MIS 102  | Spreadsheet Software Laboratory | 1 |
|               | GEOG 105 | Physical Geography: Geomorphology | 3 |
|               | GIS 105  | Map and Compass/GPS | 1 |
|               | MATH 112 | Trigonometry | 4 |
|               | Humanities elective | 3 |
|               | Total     |           | 16 |

| Sophomore Year | Fall       | CHE 222 | General Chemistry | 5 |
|                | BIO 261   | Sophomore Project Proposal | 1 |
|                | GIS 205   | GIS Data Integration | 1 |
|                | MATH 251  | Integral Calculus | 4 |
|                | WRI 227   | Technical Report Writing | 3 |
|                | Total     |           | 17 |

| Sophomore Year | Winter    | CHE 222 | General Chemistry | 5 |
|                | BIO 261   | Sophomore Project Proposal | 1 |
|                | GIS 205   | GIS Data Integration | 1 |
|                | MATH 251  | Integral Calculus | 4 |
|                | WRI 227   | Technical Report Writing | 3 |
|                | Total     |           | 17 |

| Sophomore Year | Spring    | CHE 223 | General Chemistry | 5 |
|                | BIO 262   | Sophomore Project | 4 |
|                | BIO 327   | General Ecology | 4 |
|                |CHE 231    | Streamwater Chemistry | 1 |
|                |CHE 232    | Streamwater Sampling | 2 |
|                | Total     |           | 16 |

#### Junior Year

| Fall          | BIO 471 | Senior Project Proposal Research | 1 |
|              | CHE 331 | Organic Chemistry I | 4 |
|              | MATH 361 | Statistical Methods I | 4 |
|              | PHY 221 | General Physics with Calculus | 4 |
|              | SPE 321 | Small Group and Team Communication | 3 |
|              | Total   |           | 16 |

| Winter        | BIO 472 | Senior Project Proposal | 1 |
|              | BIO 485 | Klamath Bioregional Studies | 1 |
|              | or      | Social Science elective | 3 |
|              | CHE 315 | Environmental Chemistry and Toxicology | 3 |
|              | PHY 222 | General Physics with Calculus | 4 |
|              | WRI 321 | Advanced Technical Communication | 1 |
|              | Total   |           | 15 |

| Spring        | BIO 434 | Data Analysis Methods | 1 |
|              | or      | MATH 362 | Statistical Methods II | 4 |
|              | PHY 473 | Senior Project Data Collection | 3 |
|              | PHY 223 | General Physics with Calculus | 4 |
|              | WRI 321 | Advanced Technical Communication | 1 |
|              | Total   |           | 14 |

| Fall          | BIO 474 | Senior Project Data Analysis and Presentation | 2 |
|              | BUS 415 | Environmental Regulation | 3 |
|              | CHE 465 | Fate and Transport of Pollutants | 4 |
|              | WRI 322 | Advanced Technical Communication | 1 |
|              | Total   |           | 14 |

| Winter        | BIO 485 | Klamath Bioregional Studies | 1 |
|              | or      | Social Science elective | 3 |
|              | WRI 323 | Advanced Technical Communication | 1 |
|              | Total   |           | 14 |

| Spring        | Humanities elective | 3 |
|              | Social Science elective | 3 |
|              | Technical Emphasis | 4 |
|              | Technical Emphasis | 4 |
|              | Total   |           | 14 |

| Fall          | Humanities elective | 3 |
|              | Social Science elective | 3 |
|              | Technical Emphasis | 4 |
|              | Technical Emphasis | 4 |
|              | Total   |           | 14 |

** * May be 3 or 4 credits; a total of 24 credits of “technical emphasis” courses are required.
** ** Algebra-based PHY 201, PHY 202, and PHY 203 or calculus-based PHY 221, PHY 222, and PHY 223 are acceptable.

Select 24 credits from one of the following areas of emphasis:

#### Watershed Science Emphasis:

| BIO 337 | Aquatic Ecology | 4 |
| BUS 416 | Environmental Management | 3 |
| CHE 325 | Soil Science | 4 |
| CHE 332 | Organic Chemistry II | 4 |
| CHE 333 | Organic Chemistry III | 4 |
| CHE 341 | Instrumental Methods/Data Acquisition I | 4 |
| CHE 342 | Instrumental Methods/Data Acquisition II | 4 |
| CHE 450 | Biochemistry I | 4 |
| CHE 451 | Biochemistry II | 4 |
| CHE 452 | Biochemistry III | 4 |
| CHE 455 | Water Quality Technology | 3 |
| CIV 362 | Hydrology and Surface Water Management | 3 |
| CIV 466 | Solid and Hazardous Waste Management | 3 |
| CIV 467 | Groundwater | 3 |
| ENV 325 | Environmental Microbiology | 4 |
| ENV 336 | Environmental Hydrology | 4 |
| ENV 466 | Integrated Watershed Analysis | 4 |
| ENV | ENV elective | varies |

#### GIS Emphasis:

| ENV | ENV elective | varies |
| ENV | ENV elective | varies |
| GIS 306 | Geospatial Raster Analysis | 4 |
| GIS 316 | Geospatial Vector Analysis I | 4 |
| GIS 332 | Customizing the GIS Environment I | 4 |
| GIS 426 | Geospatial Vector Analysis II | 4 |
| GIS 432 | Customizing the GIS Environment II | 4 |
| GIS 446 | GIS Database Development | 4 |
| GIS 456 | GIS Management | 3 |

#### Sustainable Technologies Emphasis:

| ANTH 335 | The Built Environment | 3 |
| BUS 304 | Engineering Management | 3 |
| BUS 305 | Management of Engineering Resources | 3 |
| BUS 416 | Environmental Management | 3 |
| CHE 260 | Electrochemistry for Renewable Energy Applications | 4 |
| CIV 315 | Principles of Environmental Engineering | 4 |
| CIV 466 | Solid and Hazardous Waste Management | 3 |
| CIV 467 | Groundwater | 3 |
| MET 160 | Materials I | 3 |
| MET 360 | Materials II | 3 |
| RHE 201 | Introduction to Renewable Energy | 4 |
| RHE 331 | Fuel Cells | 3 |
| RHE 344 | Nuclear Energy | 3 |
| RHE 346 | Biofuels and Biomass | 3 |

* ENV 343, ENV 435, adviser approved independent study, or an upper-division elective from another department with adviser approval.
1 Sustainable Technologies Emphasis students substitute CHE 260 Electrochemistry for Renewable Energy.
2 Sustainable Technologies Emphasis students substitute ENV 343, ENV 435, adviser approved independent study, or an upper-division elective from another department with adviser approval.
3 Sustainable Technologies Emphasis students substitute MATH 251 Differential Calculus.
Health Sciences Program
(See also Pre-Medical Professions Major in the Biology Program)

Burton Clark, Program Director


Degree Offered
Bachelor of Science in Health Sciences

Objective and Career Opportunities
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 undergraduate and graduate programs in the medical sciences. The program will meet prerequisite requirements for schools of medicine, dentistry, veterinary medicine, osteopathic medicine, optometry, pharmacy, and podiatry and for graduate programs in physical therapy and occupational therapy. The first two to three years of the curriculum can also be used as preparation for allied health programs such as medical laboratory technology, respiratory therapy, speech pathology and audiology, medical imaging technology, dental hygiene, nursing, and related fields. Courses in health management, microbiology, and molecular biology also provide strong preparation for graduate work in biotechnology, education, public health, and medical administration.

Student Preparation
The 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). Admission requirements for the first year of the program are identical to the published admission requirements for OIT.

Degree Requirements
The minimum graduation requirement is 180 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 Health Sciences. 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 different health professions and graduate schools differ, some upper-division courses may be substituted for others, with approval of your academic adviser. The prescribed courses of the Health Sciences Program are very similar to the pre-medical professions major in the Biology Program. Students may choose either a biology degree or health sciences degree.

Bachelor of Science in Health Sciences

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

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<th>Freshman Year</th>
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<tbody>
<tr>
<td>BIO 109</td>
<td>Principles of Biology</td>
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<tr>
<td>BIO 211</td>
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<tr>
<td>MATH 112</td>
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<td>WRI 121</td>
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<tbody>
<tr>
<td>BIO 200</td>
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<tr>
<td>MATH 361</td>
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<td>BIO 345</td>
<td>Medical Microbiology</td>
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<td>CHE 221</td>
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<td>SPE 111</td>
<td>Fundamentals of Speech</td>
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<tr>
<td>BIO 209</td>
<td>Current Research Topics in Medical Sciences</td>
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<td>BIO 341</td>
<td>Medical Genetics</td>
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<tr>
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<td>Human Anatomy and Physiology I</td>
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<td>WRI 327</td>
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<tr>
<th>Senior Year</th>
<th>Winter</th>
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<tbody>
<tr>
<td>BIO 346</td>
<td>Pathophysiology I</td>
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<tr>
<td>BIO 409</td>
<td>Current Research Topics in Medical Sciences II</td>
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<td>CHE 451</td>
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<tr>
<td>SPE 321</td>
<td>Small Group and Team Communication</td>
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<tbody>
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<td>Pathophysiology II</td>
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General and Major Elective Choices

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<td>BUS 306</td>
<td>Principles of Marketing</td>
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<tr>
<td>BUS 314</td>
<td>Entrepreneurship</td>
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<tr>
<td>BUS 316</td>
<td>Total Quality in Health Care</td>
<td>3</td>
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<tr>
<td>BUS 317</td>
<td>Health Care Management</td>
<td>3</td>
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<tr>
<td>BUS 335</td>
<td>Small Business Management</td>
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<tr>
<td>CHE 210</td>
<td>Clinical Pharmacology</td>
<td>3</td>
</tr>
<tr>
<td>HSC 485</td>
<td>Research and Project Proposal</td>
<td>3</td>
</tr>
<tr>
<td>MATH 362</td>
<td>Statistical Methods II</td>
<td>4</td>
</tr>
<tr>
<td>PSY 215</td>
<td>Abnormal Psychology I</td>
<td>3</td>
</tr>
<tr>
<td>PSY 216</td>
<td>Abnormal Psychology II</td>
<td>3</td>
</tr>
<tr>
<td>PSY 220</td>
<td>Community Psychology</td>
<td>3</td>
</tr>
<tr>
<td>PSY 311</td>
<td>Human Growth and Development I</td>
<td>3</td>
</tr>
<tr>
<td>PSY 312</td>
<td>Human Growth and Development II</td>
<td>3</td>
</tr>
<tr>
<td>PSY 336</td>
<td>Health Psychology I</td>
<td>3</td>
</tr>
<tr>
<td>PSY 337</td>
<td>Health Psychology II</td>
<td>3</td>
</tr>
</tbody>
</table>

Other general and major electives with adviser consent.

* MATH 243 may be substituted with adviser consent.

** PHY 201, PHY 202 and PHY 203 may be substituted with PHY 221, PHY 222 and PHY 223 with adviser consent.

When choosing the major 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.
Nursing—
Oregon Statewide
Integrated Nursing Program

Michael R. Bleich, R.N., Ph.D., Dean

Terry Ross, R.N., M.S., C.W.C.N., Interim Director, Academic Programs

Professor: J. Heineken

Assistant Professors: T. Ross


This program is offered at Oregon Institute of Technology by the Oregon Health & Science University School of Nursing, in cooperation with OIT.

Degrees 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 OIT 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 at each campus and at outreach sites such as Bend, Oregon.

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 upper-division nursing major. Students enrolled at OIT will be given first consideration for admission to nursing on the OIT campus.

The baccalaureate in Nursing Program provides the essential foundation for professional nursing licensure and practice. The Nursing Program, as of fall 2003, includes one year 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. Please contact the School of Nursing for information at (541) 552-8421 or at cook1@ohsu.edu.

Approval and Accreditation

The Nursing Program is approved by the Oregon State Board of Nursing (OSBN) and accredited by the National League for Nursing (NLN-AC—Address: 61 Broadway, NY, NY 10006). The School of Nursing holds the approval of the Commission on Collegiate Nursing Education (CCNE). The NLN and CCNE are specialized accrediting bodies recognized by the Council for Higher Education Accreditation and/or the Secretary of the U.S. Department of Education.

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. To apply you must have 30 credits completed by the end of fall term, be at the MATH 95/MATH 100 or higher level, have completed Human Anatomy and Physiology I and have a minimum 3.0 GPA.

Transfer Credits

Transfer credits from NLN or CCNE accredited nursing programs 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 adviser for requirements for the nursing major.

Bachelor of Science with a Major in Nursing

Curriculum

Required courses and terms during which they may be taken.

Pre-Nursing

Freshman Year Fall
BIO 231 Human Anatomy and Physiology I 4
CHE 101/CHE 104 Elementary Chemistry* 4
or
General, HUM, NS or SS electives** 4
MATH 95/MATH 100* Intermediate Algebra
or
MATH 243 Introductory Statistics 4
PSY 201 Psychology 3
Total 15-17

Freshman Year Winter
BIO 232 Human Anatomy and Physiology II 4
CHE 102/CHE 105 Elementary Chemistry* 4
or
General, HUM, NS, or SS electives** 4
WRI 121 English Composition 3
PSY 311 Human Growth and Development I 3
General, HUM, NS or SS electives** 1-3
Total 15-18

Freshman Year Spring
BIO 233 Human Anatomy and Physiology III 4
CHE 103/CHE 106 Elementary Chemistry* 4
or
General, HUM, NS or SS electives** 2-4
BIO 205 Nutrition* 3
PSY 312 Human Growth and Development II 3
WRI 122 English Composition 3
Total 15-17

University Departments 121
* Math competency may be demonstrated by a math placement test or by successful completion of MATH 95/MATH 100 or higher. MATH 100 qualifies you to take the Chemistry series which is a prerequisite for the Nutrition course on the OIT campus. Please note that MATH 95/MATH 100 is also a prerequisite for MATH 243 Introductory Statistics, a course required later in the Nursing Program. MATH 95 credits do not count toward your degree, but are counted toward the 30 required credits to apply.

** General, Humanities, Natural Science or Social Science electives (college-level 100 or above).

• If Nutrition is taken elsewhere, CHE 101/ CHE 104, CHE 102/CHE 105, CHE 103/ CHE 106 is not required, although Chemistry is highly recommended.

### Professional Courses

#### Sophomore Year Fall
- BIO 207 Human Genetics 3
- NRS 210 Foundations of Nursing– Health Promotion 9
- WRI 123 English Composition
  or preferably
- WRI 227 Technical Report Writing 3
  Total 15

#### Sophomore Year Winter
- NRS 230 Clinical Pharmacology I 3
- NRS 232 Pathophysiological Processes I 3
- NRS 211 Foundations of Nursing in Chronic Illness I 6
- BIO 105 Microbiology 4
  Total 16

#### Sophomore Year Spring
- NRS 231 Clinical Pharmacology II 3
- NRS 233 Pathophysiological Processes II 3
- NRS 212 Foundations of Nursing in Acute Care I 6
  Total 12

#### Junior Year Fall
- NRS 322 Foundations of Nursing in Acute Care II and End-of-Life 9
  General, HUM, NS or SS electives 4
  Total 13

#### Junior Year Winter
- NRS 321 Foundations of Nursing in Chronic Illness II and End-of-Life 9
  General, HUM, NS or SS electives 4
  Total 13

#### Junior Year Spring
- NRS 410 Population-Based Care: Chronic Illness and Health Promotion 9
- NRS 411 Epidemiology 3
- MATH 243 Introductory Statistics* 4
  Total 16
Selected Courses in 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 aquatics, fitness center activities, lifeguard training, archery, ice skating, golf, rugby, water safety instruction, basketball, varsity sports, major sports seminars in varsity sports offered at OIT, and officiating techniques.

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 and health education courses are 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.
Notes
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 business and industry. Graduate education at OIT maintains a hands-on focus. Our mission is to integrate theory and practice.

Admission
The Office of Admissions, in conjunction with the Provost’s Office and 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.
- Some programs may require qualifying examinations.

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 OIT or who graduated from OIT within the previous two years.
- Official transcripts from each postsecondary 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
OIT 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 550 paper-based TOEFL, 213 computer-based TOEFL, 79 Internet-based TOEFL, or 6.5
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 OIT, 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 OIT. 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 OIT.
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. OIT requires that international graduate students 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 550 paper-based TOEFL, 213 computer-based TOEFL, 79 Internet-based TOEFL, or 6.5 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
OIT encourages all prospective students to submit graduate application materials six to nine months in advance of the planned enrollment date. However, applications will be accepted any time before the deadlines listed below. The recommended entrance time is fall term.

- Fall Term: July 1
- Winter Term: October 1
- Spring Term: January 1

Social Security Number Disclosure and Consent Statement
U.S. nationals are requested to voluntarily provide your Social Security Number to assist OUS (and organizations conducting studies for or on behalf of OUS) in developing, validating, or administering predictive tests and assessments; administering student aid programs; improving instruction; internal identification of students; collection of student debts; or comparing student educational experiences with subsequent work force experiences. When conducting studies, OUS will disclose your Social Security Number only in a manner that does not permit personal identification of you by individuals other than representatives of OUS (or the organization conducting the study for OUS) in developing, validating, or administering predictive tests and assessments; administering student aid programs; improving instruction; internal identification of students; collection of student debts; or comparing student educational experiences with subsequent work force experiences.

By providing your Social Security Number, you are consenting to the uses identified above. This request is made pursuant to ORS 351.070 and 351.085. Provision of your Social Security Number and consent to its use is not required and, if you choose not to do so, you will not be denied any right, benefit, or privilege provided by law. You may revoke your consent for the use of your Social Security Number at any time by writing to: Registrar, Oregon Institute of Technology, 3201 Campus Drive, Klamath Falls, OR 97601.

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 early summer, 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 at OIT 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. TAs are only awarded for nine-month periods during the academic year. If you are interested in a TA, contact the individual department to determine availability.

Assistantship Offer
Assistantship contracts are awarded annually and renewal is dependent upon competent performance of assistantship duties, adequate academic progress and the availability of funds. Assistantship appointments are for two academic years; however, under special circumstances, appointments may continue for a third and final year.
Assistantships may include a tuition waiver as well as a monthly stipend based upon a percentage of a full-time equivalent (FTE) salary. Graduate student stipends are not subject to Social Security (FICA) taxes but are subject to income taxes and should be reported on your tax return.

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 OIT. Other academic policies and procedures are described and/or defined in the general policies of OIT.

Student Rights and Responsibilities
OIT 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. OIT 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 adviser.

Academic Integrity
OIT'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 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 adviser, 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 OIT'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 OIT Web site.

Student Records
The Registrar's Office maintains a permanent file for each graduate student. Faculty advisers 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
OIT undergraduate seniors may enroll in 500-level graduate courses for graduate credit with the approval of the student’s undergraduate adviser and the graduate program director. Nine credits are applicable to a graduate degree.

Students who are not yet admitted to OIT may take up to nine credits which can apply toward the graduate degree. These courses cannot count for both undergraduate and graduate credits.

OIT 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 only to a graduate degree. Students enrolled in a dual-listed 500-level course will be required to complete additional work to obtain graduate credit.

**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 “conditionally 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:** Students who have served one term on academic probation and have not raised their graduate cumulative GPA to 3.0 in the next term will be placed on academic suspension. 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 OIT catalog. A successful appeal results in probation status.

**Transfer Credits**

Students may petition to transfer up to 12 graduate term hours earned at other accredited institutions and apply those credits toward an OIT graduate degree. However, each course must be consistent with the program of study planned by the student and the graduate adviser. Only grades of A and B are acceptable as transfer credit into the graduate program.

**Graduate Grading Policy**

OIT 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.

**Withdrawals**

Students may withdraw from a course during the first 10 days of class with no entry on the permanent academic record, except for complete withdrawal from all classes. After this date and through Friday of the seventh week, students who withdraw from a class will receive a W, which is not included in the grade point average. After Friday of the seventh week, students will receive a letter grade assigned by the instructor.

A complete withdrawal from all courses is possible at any time during the term until the last day of class by filing the proper forms with the Registrar’s Office. Specific deadlines are published in the quarterly class schedule.

While it is the student’s responsibility to properly withdraw from a class, an instructor may administratively withdraw a student for non-attendance.

**Academic Requirements**

Graduate degree academic requirements are specified by the program. The student, in conference with the graduate faculty adviser, will prepare a program of study for the graduate degree as a guide for planning an academic schedule. The student must then submit the proposed program to the graduate program director for approval.

**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

**Right of Appeal**

Students have the right to appeal academic policies or requirements. Grade appeals should be initiated through the instructor, graduate program coordinator, and the dean. For appeals regarding specific degree requirements, students should consult their graduate adviser, the graduate program coordinator, and the Graduate Council. Students should submit all other academic policy appeals in writing to the Graduate Council through the Provost’s Office.
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. Absence of an (F, W, or S) does not necessarily mean the course is 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.

<table>
<thead>
<tr>
<th>Numbering Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-99</td>
<td>Preparatory and Developmental Courses</td>
</tr>
<tr>
<td></td>
<td>Courses numbered below 100 are not applicable toward a degree even though units are assigned, grades are awarded and tuition is assessed.</td>
</tr>
<tr>
<td>100-199</td>
<td>Lower-Division Courses (freshman and sophomore)</td>
</tr>
<tr>
<td>200-299</td>
<td>First-Year Courses</td>
</tr>
<tr>
<td>200-299</td>
<td>Second-Year Courses</td>
</tr>
<tr>
<td>300-399</td>
<td>Upper-Division Courses (junior and senior)</td>
</tr>
<tr>
<td>400-499</td>
<td>Third-Year Courses</td>
</tr>
<tr>
<td>400-499</td>
<td>Fourth-Year Courses</td>
</tr>
<tr>
<td>500-599</td>
<td>Graduate Courses</td>
</tr>
</tbody>
</table>

**Other Codes**

*Each Term:*

Some courses in this section have a code following the course title. This code designates when the course will be offered. F indicates fall, W indicates winter, S indicates spring.

*Even or Odd:*

When accompanying a course description, these terms indicate that a given course is offered during the designated term or terms every other year only. For example:

<table>
<thead>
<tr>
<th>Course</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 355</td>
<td>Graphical Analysis</td>
</tr>
<tr>
<td>(F, Even)</td>
<td></td>
</tr>
</tbody>
</table>

means that this course is offered only in even numbered years during the fall term.

*Lecture, Lab, Credit Hours:*

The three numbers following the course title. For example:

CST 101 Introduction to Personal Computing

(3-3-4) = weekly lecture hours – lab hours – total credits
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.

Quarter Credit: 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.).

(ACAD) Academic Success

ACAD 101 Student Success Seminar
(Variable Credit)
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
(2-0-2)
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, ACAD 207, ACAD 307, ACAD 407 Seminar
(Hours to be arranged each term.)

ACAD 115 Career Exploration
(3-0-3)
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
(2-0-2)
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
(2-0-2)
For “America Reads” tutors. Provides information about how children learn to read and write, strategies for teaching children and working in an elementary school.

(ACC) Accounting

ACC 101 Introduction to Accounting
(3-0-3)
The principles of elementary accounting systems for small businesses.

ACC 107, ACC 207, ACC 307, ACC 407 Seminar
(Hours to be arranged each term.)

ACC 115 Basic Income Tax Preparation
(2-4-3)
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
(3-0-3)
Business math such as decimals, percents, markups, proration and interest. Emphasis on operational techniques of electronic calculators for problem solving.

ACC 201 Principles of Accounting I
(4-0-4)
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 Principles of Accounting II
(4-0-4)
A continuation of ACC 201 with emphasis on corporate accounting. Prerequisite: ACC 201 with grade “C” or better.

ACC 203 Principles of Managerial Accounting
(4-0-4)
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
(2-3-3)
Spreadsheet software used to solve accounting problems, model-building techniques. Integrated accounting software introduced. Prerequisite: ACC 201.
ACC 295 Individual Studies
(Hours to be arranged each term.)

ACC 298 Reading and Conference
(Hours to be arranged each term.)

ACC 299 Laboratory Practice
(Hours to be arranged each term.)

ACC 320 Cost Accounting I
(4-0-4)
Cost measurement, planning, control and performance evaluation and behavioral issues. Cost accumulation systems including job order costing, process costing and activity-based costing will be explored.
Prerequisite: ACC 203 with grade “C” or better.

ACC 321 Cost Accounting II
(4-0-4)
Continuation of Cost Accounting I. Strategic planning and financial budgeting. Techniques to control and evaluate operations including variance analysis based on flexible budgets and standard costs. The role of responsibility accounting for revenue, cost, contribution and profit centers will be investigated.
Prerequisite: ACC 320 with grade “C” or better.

ACC 325 Finance
(4-0-4)
Emphasis on working capital management, long-term finance and capital structure.
Prerequisites: ACC 203 and MATH 105 or MATH 111.

ACC 331 Intermediate Accounting I
(4-0-4)
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 Intermediate Accounting II
(4-0-4)
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 Intermediate Accounting III
(4-0-4)
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 Information Systems
(4-0-4)
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, MIS 312.

ACC 411 Income Tax Procedures
(4-0-4)
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
(4-0-4)
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 Laboratory
(0-6-2)
Lab accompanying class content in ACC 411.

ACC 431 Advanced Accounting I
(4-0-4)
Prerequisite: ACC 333 with grade “C” or better.

ACC 432 Advanced Accounting II
(4-0-4)
Analysis of problems facing small, medium and large companies, with emphasis upon an integrated and concurrent decision making methodology applying economics, finance, organizational theory, quantitative analysis and accounting and tax theory.
Prerequisite: ACC 431 with grade “C” or better.

ACC 435 Auditing
(4-0-4)
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.
Prerequisite: ACC 333, ACC 405, both with grade “C” or better.

ACC 465 Case Studies in Accounting
(4-0-4)
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, ACC 496 with grade “C” or better.

ACC 496, 497 Senior Project
(3-0-3)
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.
Prerequisite: ACC 320 and ACC 405, or instructor consent.

(AHED) Allied Health Education

AHED 107, AHED 207, AHED 307, AHED 407 Seminar
(Hours to be arranged each term.)

AHED 450 Instructional Methods
(3-0-3)
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 RCP or BDH degree completion program.

AHED 451 Instructional Experience
(2-3-3)
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  
(0-9-3)  
Student and faculty adviser design an individualized teaching experience. A learning contract is written and implemented.  
Prerequisite: AHED 451 or AHED 460.

AHED 460 Fundamentals of Distance Education  
(3-0-3)  
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.

(ANTH) Anthropology  

ANTH 101 Introduction to Physical Anthropology  
(3-0-3)  SS  
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 Introduction to Archeology  
(3-0-3)  SS  
Survey of the science of archeology. 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 archeology.

ANTH 103 Introduction to Cultural Anthropology  
(3-0-3)  SS  
Culture, language, subsistence patterns, group formation, kinship, economic systems, political organizations, religion and cultural change.

ANTH 107, ANTH 207, ANTH 307, ANTH 407 Seminar  
(Hours to be arranged each term.)  SS  
ANTH 335 The Built Environment  
(3-0-3)  SS  
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 452 Globalization  
(3-0-3)  SS  
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.

(BIO) Biology  

BIO 101 General Biology  
(3-3-4)  
Basic animal physiology with emphasis on humans. (Cannot be used for graduation credit by students who have taken BIO 231, BIO 232 or BIO 233.)

BIO 103 General Biology  
(3-0-3)  SS  
Introduction to cell biology, genetics and evolution.

BIO 102 General Biology  
(3-0-3)  
Consideration of phylogenetic relationships of the major groups of plants and animals.

BIO 105 Microbiology  
(3-0-3)  
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, BIO 207, BIO 307, BIO 407 Seminar  
(Hours to be arranged each term.)

BIO 109 Introduction to the Medical Sciences  
(1-2-2)  
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 110 Introduction to Environmental Sciences  
(3-3-4)  
A topical overview of environmental sciences stressing the integration of the social, natural and physical sciences. Emphasis on active learning.

BIO 111 Introduction to Environmental Sciences  
(Hours to be arranged each term.)

BIO 112 Introduction to Data Analysis  
(0-3-1)  
Skills in data acquisition from primary and secondary sources. Time series and cross-sectional data. Extensive use of spreadsheets for data analysis and graphical display including trendlines, histograms and cumulative frequency distributions. A series of self-paced tutorials on CD. Basic computer proficiency is expected.

BIO 200 Medical Terminology  
(2-0-2)  
Basic structure of medical works including prefixes, suffixes, roots and combining forms. Correct spelling, pronunciation and meaning of terms are stressed.

BIO 205 Nutrition  
(3-0-3)  
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.  
Pre- or corequisite: CHE 103 or BIO 213 or instructor consent.
**BIO 209 Current Research Topics in Medical Sciences I**  
(1-0-1)  
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**  
(3-3-4)  
Principles of modern biology emphasizing form and function of multicellular plants, major vertebrate phyla and general vertebrate morphology and physiology.

**BIO 212 Principles of Biology**  
(3-3-4)  
Principles of modern biology emphasizing evolution, ecology, population genetics and behavior of organisms. Prerequisite: BIO 211 with grade “C” or better, or with instructor consent.

**BIO 213 Principles of Biology**  
(3-3-4)  
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. Prerequisite: BIO 212 with grade “C” or better, or with instructor consent.

**BIO 216 Introduction to Veterinary Medicine**  
(3-0-3)  
Covers many aspects of animal health and care, as well as their impact on society. Discussions of husbandry, nutrition, anatomy, preventive medical care, common diseases and behavioral problems of dogs, cats, horses and exotics.

**BIO 220 Cardiovascular Physiology**  
(3-3-4)  
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 225 Riparian Assessment Methods**  
(0-3-1)  
Introduction to basic skills needed to determine the functional status of riparian systems. Vegetation identification. Habitat assessment of stream macro-invertebrates. A series of self-paced tutorials followed by an extended field exercise to be conducted on a designated Saturday.

**BIO 226 Introduction to Wildlife Rehabilitation**  
(3-0-3)  
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 Introduction to Forensic Science**  
(3-3-4)  
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 and Physiology I**  
(3-3-4)  
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 and Physiology II**  
(3-3-4)  
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 and physiology of the integumentary, skeletal, muscular and endocrine systems. Dissections and physiological experiments are conducted. Prerequisite: BIO 231 with grade “C” or better.

**BIO 233 Human Anatomy and Physiology III**  
(3-3-4)  
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 261 Sophomore Project Proposal**  
(1-0-1)  
Review of the scientific method and scientific research procedures. Identification of a research topic. Preparation and presentation of a research proposal. Prerequisite: BIO 213 or instructor consent.

**BIO 262 Sophomore Project**  
(1-9-4)  
Completion of field, laboratory, or investigative project with agencies, faculty members, or industry. Includes data collection, analysis and presentation of report. Prerequisite: BIO 261 or instructor consent.

**BIO 313 Botany**  
(2-6-4)  
Field study and identification of the flora of the Pacific Northwest. Vascular plants will be emphasized; algae, fungi and bryophytes will be considered. Principles of plant classification and common plant families are taught. A plant collection is prepared. Prerequisite: BIO 211 or instructor consent.

**BIO 317 Invertebrate Biology**  
(3-3-4)  
Survey of invertebrate animals, including morphology, physiology, ecology and phylogeny; comparative anatomy of typical metazoan forms. Laboratory exercises focus on parasites and other economically important species. Intended for biology and pre-professional health majors. Prerequisite: BIO 213 or equivalent.

**BIO 325 Applied Aquatic Botany**  
(2-3-3)  
Ecology, taxonomy and economic significance of aquatic plants, including algae. Emphasis placed on determination of contaminants in the physical or biological environment. Prerequisite: BIO 211.

**BIO 327 General Ecology**  
(3-3-4)  
An examination of ecological principles applied to microhabitats, habitats and ecosystems. Includes community ecology, population ecology and resource analysis, supplemented by regional and local field exercises with training in measurement and collection of ecological components. Corequisites: GEOG 105, BIO 111 and BIO 213.

**BIO 331 Human Anatomy and Physiology I**  
(3-6-5)  
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. Prerequisite: BIO 213 and CHE 223, both with grade “C” or better.
Courses with the following notation fulfill the appropriate general education requirements:

- **C** - Communication
- **H** - Humanities
- **SS** - Social Science.

For more information see page 45.
BIO 434 Data Analysis Methods
(3-3-4)
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. Prerequisites: BIO 112, MATH 361.

BIO 436 Immunology
(3-3-4)
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 461, BIO 462 Human Cadaver Dissection
(0-3-1)
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 consent of instructor.

BIO 471 Senior Project Proposal Research
(1-0-1)
Review of the scientific method and scientific research procedures, identification of a research topic and preparation for writing a research proposal. Prerequisite: BIO 262. Corequisite: MATH 361.

BIO 472 Senior Project Proposal
(1-0-1)
Review of research procedures including research ethics, project management, instrumentation, field methods for data acquisition and data analysis. Development and presentation of a research proposal. Prerequisite: BIO 471.

BIO 473 Senior Project Data Collection
(1-6-3)
Independent completion of field, laboratory, or investigative project in collaboration with agency, faculty or industry professionals. Includes data collection, initial analyses and presentation of initial findings. Prerequisite: BIO 472. Corequisite: BIO 434 or MATH 362.

BIO 474 Senior Project Data Analysis and Presentation
(0-5-2)
Application of appropriate statistical methods to data collected by students as part of their senior projects. Advanced techniques introduced as appropriate. Presentation of senior project data. Emphasis on the design, preparation and delivery of effective written and oral presentations. Prerequisite: BIO 473.

BIO 485 Klamath Bioregional Studies
(3-0-3)
The Klamath River Bioregion from an integrated ecological perspective. Team project in assessing current socioeconomic, cultural and ecological conditions in the bioregion and developing management strategies for sustainable resource use. Prerequisites: BIO 225 and BIO 327, or instructor consent.

(BUS) Business

BUS 101 Introduction to Business
(3-0-3)
Business organization and business fundamentals. Coverage of the basic functions of management, marketing, production, accounting, finance and other business areas. Examination of economic, cultural, ethical and additional issues and trends affecting business.

BUS 107, BUS 207, BUS 307, BUS 407 Seminar
(Hours to be arranged each term.)

BUS 215 Principles of Management
(3-0-3)
Introduction to management organization in industrial and service organizations. Functional aspects of organizational history. Team concept management, corporate cultures and business ethics. (Cannot be taken for graduation credit by students who have taken BUS 304 or BUS 317.)

BUS 304 Engineering Management
(3-0-3)
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 consent.

BUS 305 Management of Engineering Resources
(3-0-3)
The financial side of engineering management. Product costing and pricing. Departmental planning, implementation and control systems. Measuring financial performance. Project investment decisions, project management and networks for projects. Management of the supply system, inventory and suppliers. The engineer’s role in marketing. Prerequisite: Junior standing or instructor consent.

BUS 306 Principles of Marketing
(3-0-3)
Fundamentals of marketing. Product, price, promotion and place as basic concepts in modern marketing. Consumer behavior, competition, legal, ethics and other influences in the marketplace.

BUS 308 Principles of International Business
(3-0-3)
Introduction to various aspects of international business covering cultural, political, legal and economic environments, international trade theory, foreign investment strategies, negotiations, diplomacy, country selection and evaluation and human resource management.

BUS 309 Introduction to Tourism
(3-0-3)
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 314 Entrepreneurship
(3-0-3)
Identification and assessment of the critical factors that lead to a successful start-up. Focus on entrepreneurship, forms of ownership, researching a potential start-up business, profitability, financial needs and competition. Completion of a business plan for a proposed enterprise. Prerequisites: BUS 215, or BUS 304, or BUS 317; ACC 201 and ACC 203.

BUS 316 Total Quality in Health Care
(3-0-3)
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
(3-0-3)
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: Junior standing or instructor consent.

BUS 318 Consumer Behavior
(3-0-3)

BUS 319 Advertising Management
(3-0-3)
Study of integrated marketing communication strategies and tools to develop successful branding. Evaluation and selection of advertising media. Preparation of layout and copy for effective advertising performance.
Prerequisite: BUS 306 or BUS 337.

BUS 325 Finance Management
(3-0-3)
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; ACC 203.

BUS 326 Sales and Sales Management
(3-0-3)
Prerequisite: BUS 306.

BUS 328 Health Care Accounting and Finance
(3-0-3)
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 systems analysis of variance, cost effectiveness and managerial reporting are examined.
Prerequisite: ACC 201.

BUS 331 Personal Finance
(3-0-3)
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 Small Business Management
(3-0-3)
General management principles and business strategies for establishing and maintaining a small business. Using a business plan to develop operational strategies for starting a business and staying in business.
Prerequisites: BUS 215, BUS 304, or BUS 317; BUS 314.

BUS 337 Principles of Health Care Marketing
(3-0-3)
Fundamentals of health care marketing covering strategy, planning process, assessment, marketing actions, branding and evaluation.

BUS 345 Fraud Examination
(3-0-3)
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 and Tourism
(3-0-3)
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
(3-0-3)
The employment process, management development and training, wage and salary administration, preventive labor programs, safety, affirmative action, worker’s compensation, grievance handling, job evaluation and job description analysis, employee services and programs.
Prerequisites: BUS 215 or BUS 304 or BUS 317.

BUS 350 Hospitality Management
(3-0-3)
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 economic aspects of the industry. (Cannot be taken for graduation credit by students who have taken BUS 215, BUS 304 or BUS 317.)

BUS 355 Business Law
(3-0-3)
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; administrative law; and criminal law as it applies to business and industry.

BUS 356 Business Presentations
(3-0-3)
Design, preparation and delivery of effective business presentations. Emphasis on integration of skills in speech, written communications and desktop publishing in the development of effective presentations in the multimedia environment.
Prerequisites: SPE 111, WRI 227.

BUS 358 Marketing for Hospitality and Tourism
(3-0-3)
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 386 Real Estate Law
(3-0-3)
Agency relationships between client, brokers and salesman. Common real estate contractual problems. Fraud, misrepresentation and other ethical problems.

BUS 387 International Human Resource Management
(3-0-3)
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 395 Industrial and Transportation Law
(3-0-3)
Problems in administrative law as they apply to the transportation industry. Problems under the Occupations Safety and Health Act and a review of the liabilities of manufacturers’ and sellers’ products.

BUS 397 Labor Relations
(3-0-3)
Industrial labor concepts including a study of wages, unemployment, organized labor, collective bargaining, union policies and methods, labor problems of employers and methods of seeking industrial peace.
Prerequisite: BUS 215 or instructor consent.

BUS 399 Marketing Special Topics
(3-0-3)
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 306.

BUS 405 Reading and Conference
(Hours to be arranged each term.)

BUS 414 Marketing Research
(3-0-3)
Introduction to the research function as it applies to marketing. Research methodology, design, surveys, data collection, interpretation and recommendations.
Prerequisites: MATH 361, WRI 227.

BUS 415 Environmental Regulation
(3-0-3)
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 355.

BUS 416 Environmental Management
(3-0-3)
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 201N or BIO 112.

BUS 434 Global Marketing
(3-0-3)
Comprehensive study in financial, legal, social, religious and cultural influences on marketing in foreign countries. The problems and challenges of global marketing and how to utilize them. Includes international challenges of Internet marketing.
Prerequisite: BUS 306 or BUS 308.

BUS 435 New Product Development
(3-0-3)
The new product development process. New idea generation, screening, evaluation, development and commercialization. Managerial strategies, support and product testing.
Prerequisite: BUS 215, BUS 306.

BUS 441 Leadership
(3-0-3)
Examination of leadership characteristics, models, roles and theories. Societal issues for leaders in the current global business environment. Understanding personal leadership style.
Prerequisite: BUS 215, BUS 304, or BUS 317; senior standing or instructor’s consent.

BUS 447 Controversial Issues in Management
(3-0-3)
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.

BUS 456 Business Research Methods
(3-0-3)
Prerequisites: MATH 361, WRI 227.

BUS 457 Business Research Methods II
(3-0-3)
Emphasizes quantitative elements of research methods including presenting and describing information, drawing conclusions about populations using sample information; making reliable forecasts; and improving business processes.
Prerequisites: BUS 456 and MIS 375.

BUS 467 Service Management
(3-0-3)
The nature of service and service encounters, strategy and competitiveness. Design of service systems. Facilities location, design and layout. Service quality and continuous improvement.
Prerequisites: BUS 215, MATH 361.

BUS 473 Marketing Plan Development
(3-0-3)
Development of an in-depth marketing plan for a local community business. All aspects of the plan will be covered in detail.
Prerequisite: BUS 306, BUS 319.

BUS 476 EDP Auditing and Controls
(3-0-3)
Computer methods for auditing and designing control in an electronic data processing environment. Concepts and procedures used to define controls and assess compliance with professional standards and management objectives.
Prerequisites: Computer language.

BUS 478 Cases in Strategy and Policy
(3-0-3)
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.
Prerequisite: Senior Project.

BUS 496, BUS 497 Senior Project
(1-6-3)
Senior students plan, develop and complete a project for a client or an independent research project. Includes topics dealing with client contact, time management and estimation, task definition, privacy and client confidentiality. Periodic progress reports and presentations required. Instructor functions as a consultant.
Prerequisites: ACC 325; WRI 227.
Corequisite: BUS 356.

(CHE) Chemistry

CHE 101 Elementary Chemistry
(3-0-3)
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.
Prerequisite: MATH 100.
Corequisite: CHE 104 (lab).
CHE 102 Elementary Chemistry  
(3-0-3)  
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 or instructor consent. Corequisite: CHE 105 (lab).

CHE 103 Elementary Chemistry  
(3-0-3)  
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 or instructor consent. Corequisite: CHE 106 (lab).

CHE 104 Elementary Chemistry Laboratory  
(0-3-1)  
Lab accompanying class content in CHE 101. Corequisite: CHE 101.

CHE 105 Elementary Chemistry Laboratory  
(0-3-1)  
Lab accompanying class content in CHE 102. Corequisite: CHE 102.

CHE 106 Elementary Chemistry Laboratory  
(0-3-1)  
Lab accompanying class content in CHE 103. Corequisite: CHE 103.

CHE 107, CHE 207, CHE 307, CHE 407 Seminar  
(Hours to be arranged each term.)

CHE 201 General Chemistry  
(3-0-3)  
Atomic and molecular structure, chemical bonding, chemical and physical properties, introduction to stoichiometry and thermochernistry are presented. Prerequisite: High school chemistry or CHE 101 equivalent. Pre- or corequisite: MATH 111. Corequisite: CHE 204 (lab).

CHE 202 General Chemistry  
(3-0-3)  
A continuation of CHE 201. This course discusses the behavior of gases, liquids and solids, the properties of solutions, chemical kinetics and an introduction to chemical equilibrium. Prerequisite: CHE 201 and CHE 204 (lab). Corequisite: CHE 205 (lab).

CHE 203 General Chemistry  
(3-0-3)  
A continuation of CHE 202. This course continues the discussion of chemical equilibrium and its applications in aqueous solutions including pH, buffers, solubility and complexation. Also included are oxidation-reduction processes and electrochemistry, thermodynamics and an introduction to nuclear chemistry. Prerequisite: CHE 202 and CHE 205 (lab). Corequisite: CHE 206 (lab).

CHE 204 General Chemistry Laboratory  
(0-3-1)  
Lab accompanying class content in CHE 201. Corequisite: CHE 201.

CHE 205 General Chemistry Laboratory  
(0-3-1)  

CHE 206 General Chemistry Laboratory  
(0-3-1)  
Lab accompanying class content in CHE 203. Corequisite: CHE 203.

CHE 210 Clinical Pharmacology  
(3-0-3)  
The drug action of selected pharmaceutical. Emphasis is placed on drug interactions, routes of administration and effects on body systems. Prerequisites: BIO 231, BIO 232.

CHE 221 General Chemistry  
(4-3-5)  
Components of matter, atomic and molecular structure, chemical bonding, stoichiometry, major classes of chemical reactions, gases and kinetic-molecular theory, thermo-chemistry and quantum theory and atomic structure. Prerequisite: CHE 101, high school chemistry or equivalent. Corequisite: MATH 111.

CHE 222 General Chemistry  
(4-3-5)  
A continuation of CHE 221. Models of chemical bonding, shape of molecules, theories of covalent bonding, liquids and solids, properties of mixtures, bonding and reactivity and chemical kinetics. Prerequisite: CHE 221.

CHE 223 General Chemistry  
(4-3-5)  

CHE 231 Streamwater Chemistry  
(0-3-1)  
Physical and chemical principles of freshwater systems, instrumental design and operating methods for measuring pH, dissolved oxygen, ammonia, nitrate, turbidity and conductivity. A five-week series of self-paced tutorials on CD followed by an extended, instructor-led laboratory to be conducted on a designated Saturday. Prerequisite: CHE 201 or CHE 221 or instructor consent.

CHE 232 Streamwater Sampling  
(1-3-2)  
Five week course introducing calibration and operational use of the Hydrolab multiprobe. Fundamental concepts in aquatic chemistry. Project planning, constraint assessment and measurement methodologies. Computer downloading and analysis of data. Prerequisite: CHE 231. Corequisite: BIO 112 or spreadsheet proficiency.

CHE 250 Clinical Pharmacology for Nuclear Medicine  
(3-0-3)  
The drug action of selected pharmaceuticals with emphasis on those drug families of particular importance in nuclear medicine and the biochemistry of the important radiopharmaceuticals. Prerequisites: BIO 231, BIO 232.

CHE 260 Electrochemistry for Renewable Energy Applications  
(3-3-4)  
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 or CHE 222.
CHE 315 Environmental Chemistry and Toxicology  
(3-0-3)  
Mechanisms and toxicological effects of chemical reactions in water, soil and air. Global and regional concerns about atmospheric and marine contaminants, thermal pollution, pesticide and heavy metal disposal, radioisotope properties and effects of pollutants on living organisms. Organic nomenclature and selected biochemistry principles.  
Prerequisite: CHE 331 or instructor consent.

CHE 325 Soil Science  
(3-3-4)  
Prerequisite: CHE 202 or instructor consent.

CHE 331 Organic Chemistry I  
(3-3-4)  
The structures and reactions of carbon compounds with emphasis on thermodynamics, reaction pathways and spectroscopy.  
Prerequisite: CHE 223.

CHE 332 Organic Chemistry II  
(3-3-4)  
Organic stereochemistry with emphasis on biologically important molecules.  
Prerequisite: CHE 331.

CHE 333 Organic Chemistry III  
(3-3-4)  
Free radical chemistry, pharmaceutical chemistry and the mechanistic aspects of enzymatic catalysis.  
Prerequisite: CHE 332.

CHE 341 Instrumental Methods/Data Acquisition I  
(3-3-4)  
An 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 232.  
Corequisite: MIS 115 or CST 116 or instructor consent.

CHE 342 Instrumental Methods/Data Acquisition II  
(3-3-4)  
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  
(3-0-3)  
A survey of the chemical kinetics and thermodynamics of corrosion, the various types of corrosion, inhibition of corrosion and industrial applications.  
Prerequisites: CHE 101, CHE 201, PHY 202 or instructor consent.

CHE 346 Corrosion Chemistry Laboratory  
(0-3-1)  
Laboratory accompanying CHE 345. Providing practical experience with electrochemical equipment used to measure corrosion processes.  
Corequisite: CHE 345.

CHE 347 Biochemistry I  
(3-3-4)  
Molecular and cellular biochemistry with emphasis on protein structure and function, DNA, RNA and analyzing, constructing and cloning DNA. Protein conformation and function, mechanisms of enzyme action and control.  
Prerequisites: BIO 213, CHE 332.

CHE 450 Biochemistry II  
(3-3-4)  
Molecular biochemistry with emphasis on biological membranes, membrane transport, muscle contraction and cell motility, hormone action, cell signaling, excitable membranes and sensory system.  
Prerequisite: CHE 450.

CHE 452 Biochemistry III  
(3-3-4)  
Molecular and cellular biochemistry with emphasis on metabolism, glucose catabolism, glycogen metabolism, citric acid cycle, electron transport and oxidative phosphorylation, nucleic acid structure, DNA replication, repair and recombination, transcription and RNA processing.  
Prerequisite: CHE 451.

CHE 455 Water Quality Technology  
(2-3-3)  
Examination of water quality relative to surface, groundwater and industrial sources. Focus on laboratory and field procedures for detection, surveillance and abatement of water pollution.  
Prerequisites: ENV 325 and CHE 342, or instructor consent.

CHE 465 Fate and Transport of Pollutants  
(3-3-4)  
Mass balance. The use of equilibrium and chemical kinetics in the modeling of pollutant transport in water, soil and air. Mixing zone analysis, the use of Darcy’s law, flow nets and the Gaussian Plume approximation. Discussion, development and use of selected modeling scenarios.  
Prerequisites: CHE 223, MATH 252.

(CIV) Civil Engineering  

CIV 101 Orientation to Engineering  
(0-3-1)  
Introduces student to the field of engineering with emphasis on civil engineering. Includes careers in engineering, engineering curriculum, the professional engineer and the successful engineering student. Incorporates team design project and requires use of word processing, Internet and e-mail protocols.

CIV 102 Basic Techniques in Engineering  
(0-3-1)  
Project-based study of various civil engineering graphical communication fundamentals, including basic sketching, lettering and drafting techniques, topographic map reading and analysis, plan and profile construction, use of scales. Continuation of the successful engineering student with introduction of time management practices and use of spreadsheets.  
Prerequisite: CIV 101 with grade “C” or better or instructor consent.

CIV 103 Freshman Design Experience  
(0-3-1)  
Fundamentals of engineering problem solving, with individual and team design problems of increasing complexity, culminating in a team design experience. Introduces study of engineering ethics and professional communication techniques, written and verbal.  
Prerequisite: CIV 102 with grade “C” or better or instructor consent.

Courses with the following notation fulfill the appropriate general education requirements:  
C – Communication  
H – Humanities  
SS – Social Science.  
For more information see page 45.
### CIV 107, CIV 207, CIV 307, CIV 407 Seminar
(Hours to be arranged each term.)

### CIV 112 Graphical Communication Techniques in Civil Engineering
(1-6-3)
Graphical communication in civil engineering using computer aided drafting software. Emphasis on 2D with introduction to 3D methodologies, using industry standard 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.

### CIV 221 Engineering Geology
(2-3-3)
Study of physical geology fundamentals with emphasis on near surface processes and their impact on engineering practice and design. Focus is the solid earth, the hydrosphere and near-surfaces processes including geologic hazards. Prerequisite: MATH 251 with grade “C” or better or instructor consent.

### CIV 223 Elementary Properties of Materials
(3-3-4)
Study of the engineering properties of soil and concrete. Development of proper field and laboratory testing methods for classifying and evaluating soil characteristics and principles of quality control. Testing and mixing concrete based on aggregate properties determined in the laboratory. Prerequisite: CIV 101 with grade “C” or better or instructor consent.

### CIV 299 Independent Studies
(Hours to be arranged each term.)

### CIV 315 Principles of Environmental Engineering
(4-0-4)
Environmental engineering 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. Prerequisite: CHE 201 with grade “C” or better.

### CIV 317 Economics for Civil Engineers
(3-0-3)
Economic analysis and evaluation of civil engineering projects. Economic evaluation from the perspective of the consulting engineer and contractor will be explored. Basic economic concepts such as equivalent worth, depreciation, taxes and statistical risk will be covered. Prerequisite: MATH 361 with grade “C” or better.

### CIV 321 Soil Mechanics
(3-3-4)
Advanced soil topics in permeability and seepage, effective stress, consolidation and settlement, shear strength, lateral earth pressure, soil bearing capacity and slope stability. Laboratory tests include hydraulic conductivity, direct shear and unconfined compression. Prerequisites: CIV 223, ENGR 213 both with grade “C” or better.

### CIV 322 Foundation Engineering
(3-0-3)
Analysis and design of shallow footings, deep foundations including piles, caissons and earth retaining structures. Advanced topics and computer applications in slope stability analysis. Prerequisite: CIV 321 with grade “C” or better.

### CIV 328 Structural Analysis
(3-3-4)

### CIV 331 Reinforced Concrete Design
(3-3-4)
Design and behavior of reinforced concrete members including beams, slabs, footings, retaining walls and shear walls with applications to simple structures. Lab includes construction and destructive testing of reinforced concrete beams. Prerequisite: CIV 328 with grade “C” or better.

### CIV 344 Structural Steel Design
(4-0-4)
Design and behavior of structural steel members, including beams, tension members, columns and connections with applications to simple frames and structures. Computer applications also introduced. Prerequisite: CIV 328 with grade “C” or better.

### CIV 358 Project Management
(3-0-3)
Basic project management principles and practices for engineering projects. Topics include basic management principles, delivery methods, bidding, procurement, costs, planning, scheduling, controlling and allocation of resources. Gantt charts, CPM and PERT discussed. Concepts applied using currently available computer software. Prerequisite: CIV 317 with grade “C” or better.

### CIV 361 Water and Sewer Systems Design
(3-3-4)
Population and other factors influencing water supply demands, fire flows, peaking factors and storage requirements. Estimation of wastewater flows including I/I considerations. Open channel flow design applications. Wastewater collection system design, construction and maintenance. Flows in pressure pipe systems, pipe networks analysis and design techniques. Prerequisite: ENGR 231 with grade “C” or better.

### CIV 362 Hydrology and Surface Water Management
(3-3-4)
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. Prerequisites: ENGR 231, MATH 361; both with grade “C” or better.

### CIV 371 Introduction to Transportation Engineering
(3-0-3)
Introduction to the design, planning, operation, management and maintenance of transportation systems. Principles for planning multi-modal transportation systems, layout of highways, railroads and airports, traffic flow modeling and capacity analysis. Prerequisites: CIV 112, ENGR 211, GME 161 all with grade “C” or better.

### CIV 375 Highway Engineering
(3-3-4)
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: CIV 223, ENGR 213 both with grade “C” or better.

Courses with the following notation fulfill the appropriate general education requirements:  
**C** – Communication  
**H** – Humanities  
**SS** – Social Science.  
For more information see page 45.
CIV 401/COM 401 Civil Engineering
Project I

First term of a two-term sequence integrating civil engineering design, group dynamics and technical communications. Students receive three credit hours in civil engineering design (CIV 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 adviser consent.

CIV 402/COM 402 Civil Engineering
Project II

Second term of a two-term sequence. Students receive three credit hours in civil engineering design (CIV 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 and specifications and a construction cost estimate will also be completed.
Prerequisite: CIV 401/COM 401 both with grade "C" or better.

CIV 408 Workshop

(Hours to be arranged each term.)

CIV 410 Basic Dynamics of Structures

(3-0-3)
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, model superposition, earthquake engineering, current IBC methods.
Prerequisite: CIV 328 with grade "C" or better.

CIV 415 Civil Design Software
Applications

(1-3-2)
Advanced applications of civil engineering design software will be presented and applied to current year senior design project. Design components will include, at a minimum, site topography, layout of project roadways and parking lots, and layout of water, waste water and storm water lines.
Prerequisites: CIV 112, MATH 221 both with grade "C" or better.
Corequisite: CIV 401/COM 401.

CIV 416 Structural Design for Lateral Loads

(3-0-3)
Wind and seismic forces on buildings according to the Uniform Building Code. Lateral force resisting systems for buildings. Software applications.
Prerequisite: CIV 328 with grade "C" or better.

CIV 418 Structural Matrix Analysis

(3-0-3)
Static analysis of structures using flexibility and stiffness methods with strong emphasis on computer models and solutions for practical analysis problems.
Prerequisite: CIV 328 with grade "C" or better.

CIV 435 Timber Design

(3-0-3)
Analysis and design of simple (determinate) timber beams, columns, trusses and connections using dimensioned lumber, plywood and laminated members. Computer solutions introduced.
Prerequisite: CIV 328 with grade "C" or better.

CIV 445 Design of Reinforced Masonry Structures

(3-0-3)
Analysis and design of masonry beams, walls and columns using computer solutions with emphasis on lateral design considerations.
Prerequisite: CIV 328 with grade "C" or better.

CIV 451 Cost Analysis and Estimating

(2-3-3)
Accounting and forecasting labor, materials, and equipment costs for civil engineering projects. Includes interpretation of drawings, specifications and codes, construction techniques, methods of quantity take-offs, estimating and bidding procedures. Computer applications emphasized through spreadsheets and available computer software.
Prerequisite: CIV 358 with grade "C" or better.

CIV 455 Construction Equipment

(3-0-3)
A study of construction planning, equipment, and methods. Topics to be included are an introduction to various equipment types, equipment specifications, methods of equipment production estimation, equipment owning and operating costs, and methods of operational analysis of equipment effectiveness.
Prerequisite: CIV 358 with grade "C" or better.

CIV 464 Water and Wastewater Treatment Systems Design

(3-0-3)
Prerequisites: CHE 202, CIV 315, ENGR 231, all with grade "C" or better.

CIV 466 Solid and Hazardous Waste Management

(3-0-3)
Sources and characteristics of solid and hazardous waste. Laws, regulations, methods and issues associated with the collection, treatment and disposal of solid wastes. Handling, tracking, storage, transportation, treatment, and disposal of hazardous wastes. Disposal site assessment and remediation techniques.
Prerequisite: WRI 227 with grade "C" or better.

CIV 467 Groundwater

(3-0-3)
Offers an introduction to the physical properties and principles of groundwater. Topics will include groundwater and the hydrologic cycle, fundamental fluid flow laws, groundwater resource evaluation, and groundwater contamination.
Prerequisites: BIO 327, MATH 251 for non-majors or CIV 321 for Civil Engineering majors.

CIV 475 Traffic Engineering

(3-0-3)
Principles of traffic engineering and operation, traffic engineering studies, signalized intersection design, urban parking facility design and access management.
Prerequisites: CIV 371, MATH 361 both with grade "C" or better.

CIV 476 Methods in Site Investigation

(2-3-3)
Requirements of site investigations for geotechnical and environmental engineering analysis. Review of methodologies used for site inquiry and analysis, with emphasis on non-invasive, geophysical and literature review techniques as well as field borings. Experience gained through design project(s).
Prerequisite: CIV 221 with grade "C" or better.
Corequisite: CIV 315.

CIV 499 Independent Studies

(Hours to be arranged each term.)
(CLS) Clinical Laboratory Science

CLS 100 Introduction to Clinical Laboratory Science
(2-0-2)
Orientation to the theory and practice of all aspects of the clinical laboratory science profession. The history of clinical laboratory science, professional organizations and career opportunities are discussed.

CLS 207, CLS 207, CLS 307, CLS 407 Seminar
(Hours to be arranged each term.)

CLS 406 Biometry
(2)
Problem solving related to clinical laboratory determinations to include: solution preparation, systems of measurement, dilutions, factors, graphs and standard curves, and generation of laboratory results from raw data. Descriptive and inferential statistics related to clinical laboratory science and quality control to include: measures of central tendency, probability, distributions, hypothesis testing, confidence intervals, Z-scores, t-tests, chi-square, correlation and regression analysis, and ANOVA.

CLS 410 Clinical Microbiology I
(2)
Lecture course studying the major bacterial organisms pathogenic for man. Includes culture methods, morphological characteristics, isolation methods, and identification of these organisms. Discussion of the bacterial structures and processes, genetic determinants, normal flora, host-parasite relationships, sterilization techniques, epidemiological methods, antimicrobics, and principles of laboratory diagnosis of infectious diseases.

CLS 411 Clinical Microbiology II
(2)
Lecture course studying the major spirochetes, mycobacteria, actinomycetes, chlamydia, rickettsia, fungi, and viral organisms pathogenic for man. Includes discussion of bacteria causing zoonotic diseases. Includes discussion of skin and wound infections, bone and joint infections, eye, ear, and sinus infections, dental and respiratory infections, enteric infections and food poisoning, urinary tract infections, central nervous system infections, intravascular infections, bacteremia, endotoxemia, infections of the fetus and newborn, sexually transmitted diseases, infections in the immunocompromised patient, nosocomial infections, and hospital infection control. Prerequisite: CLS 410

CLS 412 Pathophysiology
(2)
Lecture course reviewing processes that underlie many different disease states and health deviations. The study of the most common disease processes in humans and their correlation with laboratory findings are explored.

CLS 415 Clinical Chemistry I
(6)
The theory, practical application and technical performance of chemical procedures. Fundamentals of quantitative chemical analysis in the determination of endogenous and exogenous substances in body fluids such as blood, urine, spinal fluid, amniotic fluid and ascites. Emphasis areas will encompass amino acids, proteins, carbohydrates, lipoproteins, lipids, enzymes, renal and liver functions analytes, GI function related analytes, electrolytes, trace elements, hemoglobin and porphyrins, and hormones, bone metabolism, nutrition, pregnancy and fetal development analytes, and geriatric considerations.

CLS 416 Clinical Chemistry II
(2)
The theory, practical application and technical performance of chemical procedures. Fundamentals of quantitative chemical analysis in the determination of endogenous and exogenous substances in body fluids such as blood, urine, spinal fluid, amniotic fluid and ascites. Emphasis areas will encompass therapeutic drug monitoring, toxicology, and method evaluation. Prerequisite: CLS 415.

CLS 420 Clinical Immunology
(3)
Fundamentals of humoral and cellular immunity, to include innate and adaptive immunity, organs and tissues of the immune system, principles of immune activation, immunoglobulin and receptor biochemistry, immuno-genetics, cytokines, the complement system, white blood cell populations, and phagocytic mechanisms. Clinical applications to include protective immunity, immuno-deficiency conditions, inflammation, immune mediated diseases, neoplasms of the immune system, transplantation, and cancer immunology. An overview of immunossay and serology testing formats.

CLS 440 Practicum: Specimen Collection
(1)
Provides theory, demonstrations and practice of medical laboratory techniques pertaining to the science of specimen collection or phlebotomy.

CLS 441 Practicum: Instrumentation
(1)
Principles and applications of the instruments in use in the modern clinical laboratory. Basic principles of instrument operation for methods of detection, with emphasis on maintenance and safety. Instrumentation formats to include: spectrophotometry, electrochemistry, osmometry, electrophoresis, particle analysis, and measurement of radioactive decay.

CLS 442 Practicum: Hematology
(6)
Normal development and function of blood cells; mechanisms of hemostasis; basic pathophysiology of hematological and hemostasis disorders; laboratory procedures pertaining to hematology and hemostasis; microscopic examination of blood films; and correlation and interpretation of laboratory data for disease states.

CLS 443 Practicum: Transfusion Medicine
(4)
Coordinated lecture and laboratory practice. The principles of immunohematology as applied to Transfusion Medicine with special emphasis upon blood groups and types, techniques demonstrating antigen-antibody reactions; donor collection, processing, storage and hazards of transfusions, blood components and quality control are covered.
CLS 444 Practicum: Microbiology

Emphasis on clinical laboratory techniques. Methods include discussion, case histories, computer tutorials, hands-on exercises, demonstrations, problem solving, and interpretation of results. Includes study of the culture, morphological characteristics, serologic methods, isolation and identification of bacterial organisms. Includes safety, specimen collection, microscopic methods, and anti-microbial susceptibility. Organisms include normal and pathogenic gram positive cocci, gram negative cocci, gram positive bacilli, gram negative bacilli, spirochetes, anaerobes, and related organisms with emphasis on organisms seen in a clinical laboratory. Includes discussion of chlamydia, mycoplasma, and rickettsiae.

CLS 445 Practicum: Mycology

Emphasis on clinical laboratory techniques. Methods include microscopy, discussion, case histories, computer tutorials, hands-on exercises, demonstrations, problem solving, and interpretation of results. Includes study of the culture and morphological characteristics of normal and pathogenic fungi and yeast with emphasis on organisms seen in a clinical laboratory.

CLS 446 Practicum: Parasitology

Emphasis on clinical laboratory techniques. Methods include microscopy, discussion, case histories, computer tutorials, hands-on exercises, demonstrations, problem solving, and interpretation of results. Includes study of normal and pathogenic parasitic organisms with emphasis on organisms seen in a clinical laboratory.

CLS 447 Practicum: Chemistry

Principles of chemical analysis, quality control, laboratory utilization, and safety. Hands-on exercises, demonstrations, and computer tutorials illustrating chemical analysis and data evaluation in a clinical chemistry laboratory. Discussion of case studies using problem-solving methods to analyze and interpret relevant chemical analysis data.

Prerequisite: CLS 441
Co-requisite: CLS 415

CLS 448 Practicum: Immunology/Infectious Serology

Techniques in immunologic and serologic procedures. Hands-on exercises, demonstrations, and computer tutorials illustrating immunoassay analysis and data evaluation in a clinical immunology and infectious serology laboratory. Discussion of immunoassay systems to include spectrophotometry, nephelometry, turbidimetry, fluorescence, electrochemiluminescence, radioassay, and flow cytometry, instruction and practice of testing methods and interpretation to include precipitation, agglutination, receptor-ligand, complement, microscopy, electrophoresis, and cell-mediated assays. Discussion of case studies using problem-solving methods to analyze and interpret relevant immunology and serology data.

Prerequisites: CLS 420, CLS 441.

CLS 449 Practicum: Urinalysis

Study of urine with emphasis on urinalysis techniques, renal function, physical examination, chemical examination, microscopic examination, renal disease, and metabolic disorders. Methods include microscopy, discussion, case histories, computer tutorials, hands-on exercises, demonstrations, problem solving, and interpretation of results.

CLS 452 Practicum: Advanced Hematology Techniques

Microscopic examination of blood films and body fluids; instrumentation methodologies for analyzing cellular components of blood; analysis and interpretation of disease states.

Prerequisite: Completion of CLS 442 with grade "C" or better.

CLS 453 Practicum: Advanced Transfusion Medicine Techniques

Provides directed study, review and advanced problem solving and critical thinking related to Transfusion Medicine. May include, but not be limited to, discussion, case histories, computer tutorials, hands-on exercises, demonstrations, problem solving and interpretation of results.

Prerequisite: Completion of CLS 443 with grade “C” or better.

CLS 454 Practicum: Advanced Microbiology Techniques

Advanced techniques and review of microbiological organisms. Includes study of bacterial, fungal, and parasitic organisms and associated techniques. Methods include microscopy, discussion, case histories, computer tutorials, hands-on exercises, demonstrations, problem solving, and interpretation of results.

Prerequisites: CLS 410, CLS 411, CLS 444, CLS 445, and CLS 446.

CLS 457 Practicum: Advanced Chemistry/Immunology Techniques

Directed study, review, and demonstration of advanced methods and instruments in use in clinical or research laboratories. These may include, but not be limited to tissue typing, molecular methods, automated systems, flow cytometry, and chromatographic methods.

Prerequisites: CLS 447, CLS 448.

CLS 459 Practicum: Advanced Urinalysis Technique

Advanced techniques and review of urinalysis methods. Includes microscopy, discussion, case histories, computer tutorials, hands-on exercises, demonstrations, problem solving, and interpretation of results.

CLS 461 Clinical Laboratory Management I

Principles and fundamentals of management responsibilities: regulation and public financing of clinical laboratories; financial management—productivity, budgeting, cost accounting; information systems; quality assessment.

CLS 462 Clinical Laboratory Management II

Principles and fundamentals of supervision and management: communication, team building, recruitment, selection and training; employee performance; ethical considerations.

Prerequisite: CLS 461.

CLS 463 Practicum: Clinical Laboratory Management III

Applications of principles learned in CLS 461 and CLS 462 are studied using case studies, computer models, and projects.

Prerequisite: CLS 462.
CLS 470 Clinical Laboratory Externship  
16
Sixteen weeks of clinical laboratory experience at an OIT approved clinical site correlating knowledge and skills presented in lectures and labs. Designed for the development of skills necessary for entry into professional practice. Students work under the direct supervision of certified clinical laboratory scientists. Prerequisite: Successful completion of all academic coursework in the Clinical Laboratory Science Program.

(COM) Communication

COM 104 Introduction to Communication  
H  
Introduction to 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 majors.

COM 105 Introduction to Communication Theory  
H  
Introduction to Communication Theory. 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 Communication Research  
H  
Introduction to Communication Research. Introduces students to research in the communication discipline. Students find and analyze quantitative, qualitative and critical research. Introduces communication research as a process made up of methods, data-gathering, analysis and drawing conclusions. Prerequisite: COM 105. Required for majors.

COM 107, COM 207, COM 307, COM 407 Seminar  
H  
(Hours to be arranged each term.)

COM 115 Introduction to Mass Communication  
H  
Introduction to Mass Communication. 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. (Satisfies general education requirements in Communication or Humanities.)

COM 215 Creativity in Communication  
H  
Creativity in Communication. Focuses on the evolution of rhetoric. Covers rhetorical effects on individual, group and mass communication. Variety of perspectives including personal, historical, technical, ethical, cultural and critical. Emphasis on relationships between form and content, word and image, and role of visual communication in society. Prerequisites: SPE 111, WRI 227, or appropriate experience.

COM 225 Interpersonal Communication  
H  
Interpersonal Communication. An introduction to 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  
H  
Nonverbal Communication. 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, SPE 111.

COM 227 Introduction to Visual Communication  
H  
Introduction to Visual Communication. Theory and rhetoric of visual communication. Variety of perspectives including personal, historical, technical, ethical, cultural and critical. Emphasis on relationships between form and content, word and image, and role of visual communication in society. Prerequisite: WRI 122.

COM 228 KTEC Radio Production  
H  
KTEC Radio Production. Study of technical aspects of radio. Through hands-on experience, students will learn how to create and edit sound tracks and learn techniques for creating radio presentations while applying rules of content and language.

COM 229 Digital Media Production  
H  
Digital Media Production. An introduction to the ownership and structure of media, as well as media’s politics, objectives, and links to the corporate and national economy. Includes project analysis of media through the filters of ownership, sourcing, flair, advertising and ideology. Prerequisites: WRI 122, COM 115.

COM 230 Rhetorical Theory and Application  
H  
Rhetorical Theory and Application. Theories of communication and application to personal, business and industrial settings. Focuses on the evolution of rhetoric. Covers rhetorical effects on individual, group and mass communication. Prerequisites: SPE 111, WRI 227, or appropriate experience.

COM 231 Communication Ethics  
H  
Communication Ethics. Examines typical communication situations involving ethics. Methodologies for critically evaluating ethical situations. Reading, writing, and oral presentations. Prerequisite: WRI 122.

COM 232 Communication Research  
H  
Communication Research. Introduction to the history and practice of public relations. Emphasis on the practical accomplishment of public relations campaigns. Topics include internal and external audiences, brochures, press releases, internal documents, pitches, issue management, and project design and execution. Service learning course.

COM 233 Communication Theories  
H  
Communication Theories. Provides an introduction to the ownership and structure of media, as well as media’s politics, objectives, and links to the corporate and national economy. Includes project analysis of media through the filters of ownership, sourcing, flair, advertising and ideology. Prerequisites: WRI 122, COM 115.

COM 234 Communication and Media  
H  
Communication and Media. Offers an introduction to the history and practice of public relations. Emphasis on the practical accomplishment of public relations campaigns. Topics include internal and external audiences, brochures, press releases, internal documents, pitches, issue management, and project design and execution. Service learning course.

COM 235 Communication and Society  
H  
Communication and Society. Provides an introduction to the history and practice of public relations. Emphasis on the practical accomplishment of public relations campaigns. Topics include internal and external audiences, brochures, press releases, internal documents, pitches, issue management, and project design and execution. Service learning course.

COM 244 Communication and Culture  
H  
Communication and Culture. Provides an introduction to the history and practice of public relations. Emphasis on the practical accomplishment of public relations campaigns. Topics include internal and external audiences, brochures, press releases, internal documents, pitches, issue management, and project design and execution. Service learning course.

COM 245 Communication and Media  
H  
Communication and Media. Provides an introduction to the history and practice of public relations. Emphasis on the practical accomplishment of public relations campaigns. Topics include internal and external audiences, brochures, press releases, internal documents, pitches, issue management, and project design and execution. Service learning course.

COM 250 Communication and Technology  
H  
Communication and Technology. Provides an introduction to the history and practice of public relations. Emphasis on the practical accomplishment of public relations campaigns. Topics include internal and external audiences, brochures, press releases, internal documents, pitches, issue management, and project design and execution. Service learning course.

COM 251 Communication and Change  
H  
Communication and Change. Provides an introduction to the history and practice of public relations. Emphasis on the practical accomplishment of public relations campaigns. Topics include internal and external audiences, brochures, press releases, internal documents, pitches, issue management, and project design and execution. Service learning course.

COM 252 Communication and Power  
H  
Communication and Power. Provides an introduction to the history and practice of public relations. Emphasis on the practical accomplishment of public relations campaigns. Topics include internal and external audiences, brochures, press releases, internal documents, pitches, issue management, and project design and execution. Service learning course.

COM 253 Communication and Leadership  
H  
Communication and Leadership. Provides an introduction to the history and practice of public relations. Emphasis on the practical accomplishment of public relations campaigns. Topics include internal and external audiences, brochures, press releases, internal documents, pitches, issue management, and project design and execution. Service learning course.

COM 254 Communication and Ethics  
H  
Communication and Ethics. Provides an introduction to the history and practice of public relations. Emphasis on the practical accomplishment of public relations campaigns. Topics include internal and external audiences, brochures, press releases, internal documents, pitches, issue management, and project design and execution. Service learning course.

COM 255 Communication and Society  
H  
Communication and Society. Provides an introduction to the history and practice of public relations. Emphasis on the practical accomplishment of public relations campaigns. Topics include internal and external audiences, brochures, press releases, internal documents, pitches, issue management, and project design and execution. Service learning course.
COM 320 Advanced Intercultural Communication
(3-0-3) C or H
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. (Satisfies general education requirements in Communication or Humanities.)
Prerequisite: COM 205.

COM 326 Communication Research
(3-0-3)
Introduction to research methods and design. Design of both quantitative and qualitative research. Emphasis on communication based methodologies: focus groups, directed interviews, and ethnomet hodologies. Includes a research project and written and oral research reports.
Pre- or corequisite: WRI 227.

COM 345 Organizational Communication I
(3-0-3)
Introduction to the study of communication in organizations, including message movement, exchange and interpretation, identification of variables, roles and patterns influencing communication in organizations.

COM 346 Health Communication
(3-0-3)
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 “C” or better; COM 205 or equivalent.

COM 347 Negotiation and Conflict Resolution
(3-0-3) C
Theories and strategies for the conduct of conflict and negotiation across contexts. Topics include destructive conflict cycles, confronting and managing conflict, social and psychological aspects of conflict, conflict analysis, the causes of conflict, and promoting constructive conflict.
Prerequisites: SPE 321, or instructor consent.

COM 348 Facilitation
(3-0-3)
Students lead 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
(3-0-3)
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, WRI 227.

COM 365 Electronic Communication and Society
(3-0-3)
Explores the Internet as a mediator of human communication and its effect on society. Examines intrapersonal/interpersonal communication, entertainment/workplace contexts, and the convergence of technology as a global village.
Prerequisite: WRI 227.

COM 401/CIV 401 Civil Engineering Project I
(4-6-6) C
First term of a two-term sequence integrating civil engineering design, group dynamics and technical communications. Students receive three credit hours in civil engineering design (CIV 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 adviser consent.

COM 402/CIV 402 Civil Engineering Project II
(4-6-6) C
Second term of a two-term sequence. Students receive three credit hours in civil engineering design (CIV 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 and specifications and a construction cost estimate will also be completed.
Prerequisite: COM 401/CIV 401 both with grade “C” or better.

COM 415 Developing Effective Multimedia-based Presentations
(3-0-3)
Interdisciplinary course introducing students to the tools and skills associated with designing, developing, presenting and disseminating state-of-the-art multimedia presentations. Hands-on experience with graphics, digital/audio video, animation and text.
Prerequisites: CST 101 or equivalent, SPE 111 and WRI 227.

COM 420 Externship
(Variable to a total of 15 credits)
Students work in applied settings in their emphasis under the supervision of an on-site mentor. Regular contact with extern adviser. Written externship reports required.
Prerequisite: Senior standing and permission of extern adviser.

COM 421 Senior Project I
(3-0-3)
First term of a three-term comprehensive sequence. Focus on developing a written proposal for a significant project in Communication Studies. Team projects permitted; interdisciplinary projects encouraged.
Prerequisite: Senior standing.

COM 422 Senior Project II
(3-0-3)
Second term of a three-term comprehensive sequence. Focus on organizing and conducting a significant project in Communication Studies.
Prerequisite: COM 421.

COM 423 Senior Project III
(3-0-3)
Third term of a three-term comprehensive sequence. Focus on completing and documenting a significant project in Communication Studies.
Prerequisite: COM 422.

COM 425 Mediation
(3-0-3)
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
(Variable Credit 1-3)
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.
Corequisite or Prerequisite: COM 425.

Courses with the following notation fulfill the appropriate general education requirements: C – Communication H – Humanities SS – Social Science.
For more information see page 45.
COM 437 Communication Training and Development  
(3-0-3)  
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 Organizational Communication II  
(3-0-3)  
Examination of organizational communication systems and the design of communication audit procedures. Synoptic reports of findings and recommendations. Prerequisite: COM 245 or instructor consent.

COM 446 Communication and Leadership  
(5-0-3)  
In-depth study of 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 permission.

(CST) Computer Systems Engineering Technology

CST 101 Introduction to Personal Computing  
(3-3-4)  
Computer concepts, terms and trends related to personal computers (microcomputers). Introduction to Windows/NT and other commonly used Windows application programs. Hands-on labs provide experience with applications, networks and the Internet using e-mail and the World Wide Web.

CST 102 Introduction to Computer Systems  
(2-3-3)  
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 103, CST 104, CST 105 Introduction to Computer Systems I, II, III  
(1-3-2) (0-3-1) (0-3-1)  
Concepts, terms and trends related to computer engineering technology (hardware) and software engineering technology (software) curriculum. Includes discussions on fundamental aspects of the computer field. Laboratory component will introduce students to microcomputers, programming concepts and various computer engineering related software.

CST 107, CST 207, CST 307, CST 407 Seminar  
(Hours to be arranged each term.)

CST 116 C++ Programming I  
(3-3-4)  
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 117 C++ Programming II  
(3-3-4)  
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 126 with grade “C” or better.

CST 123 Topics in Computer Science  
(3-0-3)  
Overview of various software engineering subject areas. Topics include computer history, operating systems, networking, software engineering, databases, software careers, and various application areas. Also examines ethical and social issues raised by widespread use of computers. Prerequisite: CST 126 with grade “C” or better.

CST 126 C++ Programming II  
(3-3-4)  
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  
(3-0-3)  
Introduces computer elements, organization, and instruction sets, computer arithmetic, ALU, Registers, Datapath, memory and Control unit functions. Prerequisite: CST 162 with grade “C” or better.

CST 131 Computer Architecture  
(3-0-3)  
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 Electronics II – Sequential Logic with HDL  
(3-3-4)  
Introduction to Sequential Logic, Latches, Flip/Flops, Timers, Counters/Registers, HDL Implementation, PLD HW Implementation, Finite State Machine Design/Analysis, Logic Testing, MPU System, Memory Devices, DC Parameters and Timing Analysis. Laboratory integral to the class. Students must register for a laboratory section. Prerequisite: EE 131 or CST 162, both with grade “C” or better.

CST 136 Object-Oriented Programming with C++  
(3-3-4)  
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 141 Computer Programming (FORTRAN)  
(3-3-4)  
Computer concepts and problem solving methods using the FORTRAN programming language. Topics include: algorithms, simple data types, conditional and iterative structures, subprograms, structured programming and documentation. Prerequisite: MATH 111.

CST 162 Introduction to Digital Logic  
(3-3-4)  
Introduction to combinational logic. Includes introduction to DC circuits, number systems, Boolean algebra, logic gates, Muxes, Decoders, Adders, Subtracters. Logic design using a hardware description language. Laboratory integral to the class. Prerequisite: MATH 100.

Courses with the following notation fulfill the appropriate general education requirements:  
C – Communication  
H – Humanities  
SS – Social Science.

For more information see page 45.
CST 204 Introduction to Microcontrollers
(3-3-4)
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, CST 162, CST 250, each with grade “C” or better, or instructor consent.

CST 211 Data Structures
(3-3-4)
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 229 Introduction to Grammars
(3-0-3)
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 211, CST 223.

CST 231 Computer Design with Programmable Logic
(3-0-3)
This class introduces students to structured digital design techniques using programmable logic devices. The course investigates concepts, terminology and techniques used to design and implement programmable logic devices. Both software tools (synthesis tools) and programmable hardware applications will be provided to demonstrate the capabilities of programmable devices.
Prerequisite: CST 133 with grade “C” or better.
Corequisite: CST 232.

CST 232 Computer Design with Programmable Logic Laboratory
(0-3-1)
Laboratory experiments to support CST 231. Experiments with programmable logic devices including simulation.
Prerequisite: CST 133 with grade “C” or better.
Corequisite: CST 231.

CST 236 Software Systems Testing
(3-3-4)
Focus on software testing and reliably monitoring the health of software development. Topics include test driven development, story driven tests, unit tests, Web tests, load tests, static code analysis and dynamic code analysis.
Prerequisite: CST 136 with grade “C” or better.

CST 238 Graphical User Interface Programming
(3-3-4)
Introduction to Windows based programming. Topics covered include a review of the standard user interface elements of Windows, the Windows Application Program Interface (API), message processing, writing Windows Procedures, working with text, using Windows resources, creating modal and modeless dialog boxes, and using the Graphics Device Interface.
Prerequisite: CST 211 with grade “C” or better.

CST 240 UNIX
(2-3-3)
Students will study the structure of the UNIX/Linux Operating System, including: file structure, input/output processing, commands and utilities, shell configuration, communications, and script programming languages. Emphasis will be placed on lab work done within the UNIX/Linux environment.
Prerequisite: CST 126 with grade “C” or better.

CST 250 Computer Assembly Language
(3-3-4)
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 131 with grade “C” or better.

CST 260 Advanced Assembly Language Programming
(3-3-4)
Advanced applications of assembly language programming such as: interrupt handling, writing drivers involving bus interface devices, graphic applications, and interfacing with high level languages. Software projects will be developed on Intel 80XXX family of processors.
Prerequisite: CST 250, with grade “C” or better, or instructor consent.

CST 262 Digital Design Using HDL
(3-3-4)
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.
Prerequisite: CST 162 with grade “C” or better, EET 101, EET 102.

CST 276 Software Design Patterns
(3-3-4)
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 295 Individual Studies
(Hours to be arranged each term.)

CST 298 Reading and Conference
(Hours to be arranged each term.)

CST 299 Laboratory Practice
(Hours to be arranged each term.)

CST 311 Advanced Data Structures and Algorithm Analysis
(3-1-3)
Discussion and implementation of advanced data structures like K-way trees and sets. Analysis techniques of computer algorithms with respect to their time and space complexity. Emphasis will be placed on implementation of algorithms and analyzing their performance in various environments.
Prerequisite: CST 211.

CST 313 Computer Software Techniques
(3-0-3)
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 MIS 315.
Prerequisite: CST 126 with grade “C” or better.
CST 315 Embedded Sensor Interfacing and I/O

(3-3-4)

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, EE 223.

CST 316 Software Process Management

(3-3-4)

In this first term of a 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.

CST 320 Compiler Methods

(3-3-4)

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 229.

CST 321 Introduction to Microprocessors

(3-6-5)

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

(3-3-4)

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, CST 336 Software Design and Implementation I, II

(3-3-4)

In this second and third terms of a 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. Prerequisites: CST 326: CST 276, CST 316 both with grade “C” or better; CST 328, CST 324. Prerequisites: CST 336: CST 236, CST 326 both with grade “C” or better.

CST 328 Computer Graphics

(2-3-3)

Advanced algorithms and techniques are presented, including: 3-D modeling and rendering, perspective projection, hidden line/surface removal, curve/surface modeling and various lighting models. The OpenGL library will be used extensively. Prerequisite: CST 238, MATH 341 or instructor consent.

CST 331 Microprocessor Peripheral Interfaces

(3-6-5)

Extension of concepts covered in CST 321 including additional peripheral devices to expand the microprocessor’s capabilities and to create a complete system. Introduces additional I/O techniques including Interrupt driven I/O and DMA. Extensive lab provides continued experience with system design, test and debugging techniques. Prerequisite: CST 321 or instructor consent.

CST 334 Project Proposal

(1-0-1)

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. Corequisites: Hardware: CST 373; Software: CST 336.

CST 335 I/O Device Interfacing Techniques

(3-3-4)

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 133, CST 204, EET 223, or instructor consent.

CST 337 Embedded System Architecture

(3-3-4)

Architectural elements of embedded systems – microprocessor, memory, I/O ports, interrupt controller, buffers; interface protocol and timing; external interfaces; external busses including USB, PCI and Ethernet. I/O methods. Configuration, programming, testing and debugging of embedded systems. Embedded system expansion. Includes lab. Prerequisite: CST 204 with grade “C” or better.

CST 338 Computer Modeling and Simulation

(3-0-3)

Modeling and simulation of discrete and continuous systems. Discrete time and discrete event simulation models will be discussed and developed. Formal model development and model evaluation will be discussed. Prerequisites: CST 126, CST 211, MATH 465.

CST 340 Advanced UNIX

(3-0-3)

Advanced facets of the UNIX operating system will be explored. Topics of study will include: interprocess communication, programming, system administration. Students will use OIT computers operating under UNIX. Prerequisite: CST 240.

CST 344 Intermediate Computer Architecture

(3-0-3)

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 345 Hardware/Software Co-Design

(3-3-4)

Co-design of hardware and software systems. Methods used in the development of embedded systems consisting of tightly coupled hardware and software components. Prerequisites: CST 204 and CST 211 with grade “C” or better.

CST 346 .NET Programming in C#

(2-3-3)

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 or CST 313.
CST 347 Real-Time Embedded Operating Systems  
(3-3-4)  
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, CST 240, both with grade "C" or better.

CST 350 Introduction to VLSI Design  
(2-3-3)  
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, EET 308, PHY 222, or instructor consent.

CST 351 Advanced PLD Circuits  
(2-3-3)  
Study of complex PLDs (CPLDs) and other more advanced PLD architectures and related applications. Laboratory includes design capture, synthesis, placement and routing tools to implement several designs. Prerequisites: CST 231, CST 232.

CST 352 Operating Systems  
(3-3-4)  
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. Prerequisite: CST 211, CST 240 both with grade "C" or better.

CST 356 Web Design and Development  
(2-3-3)  
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 or CST 313.

CST 371, CST 372, CST 373 Embedded Systems Development I, II, III  
(3-3-4), (2-3-3), (1-3-2)  
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. Prerequisites: CST 211 or CST 313; CST 204 or instructor consent. Prerequisites: CST 371 for CST 372, CST 372 for CST 373.  
Corequisite: CST 335 for CST 371.

CST 390, CST 490 Co-op Field Practice  
(Variable Credit)  
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.

CST 405 Directed Study  
(3-0-3)  
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. Prerequisite: Junior standing in CSET and instructor consent.

CST 408 Workshop  
(Hours to be arranged each term.)

CST 412, CST 422, CST 432 Senior Development Project  
(2-3-3), (1-3-2)  
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. Prerequisite: CST 336.

CST 415 Computer Networks  
(3-1-4)  
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 layer abstract communication model. Routing and WAN Architectures. Prerequisite: CST 336 with grade "C" or better.

CST 417 Embedded Networking  
(3-3-4)  

CST 418 Data Communications and Networks  
(3-0-3)  
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. Prerequisite: CST 331 or instructor consent.

CST 420 Effective C++ and STL  
(2-3-3)  
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 423 Advanced Business Systems Programming  
(3-0-3)  
Emphasis is on structured analysis, design and programming, interactive programming, use of utilities/libraries, and integration of a high level language with a DBMS. Prerequisite: Junior standing in CSET.

CST 425 Advanced Networks and Telecommunications  
(3-0-3)  
Detailed analysis of communications networks, including telephony, wide area, and local area implementations. Emphasis will be placed on the design and management of complex networks. Opportunity will be provided to work with existing networks. Prerequisite: CST 415.
CST 426 Introduction to Artificial Intelligence
(3-0-3)
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 435 Microprogramming
(3-0-3)
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 436 Robotics
(3-0-3)
Robot models in the abstract and as practical laboratory problems. Models will be constructed using LISP and the student will be encouraged to design and build at least “an arm and hand” in the “Blocks World” as a laboratory assignment. Additional studies of applications-oriented AI research in other fields such as chemistry, medicine, and education.

CST 440 Seminars in Information Systems
(3-0-3)
Advanced studies in areas related to current developments and trends in computer systems. Topics include examining emerging technologies, ethics, security, privacy, productivity improvement methodologies and tools, computer system reviews and audits, and professional development. Prerequisite: Senior standing in CSET.

CST 441 Logic Synthesis with VHDL
(2-3-3)
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 Advanced Computer Architecture
(3-0-3)
Advanced concepts in computer architectures including pipelined, superpipelined, superscalar, and dynamically pipelined processor architectures, Parallel processors, Multiprocessors, Cache and Cache coherency. Prerequisite: CST 344 or instructor consent.

CST 445 Advanced Microprocessors and Applications
(3-3-4)
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
(3-0-3)
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
(3-3-4)

CST 456 Embedded System Testing
(3-3-4)

CST 461 Advanced Topics in VLSI Design
(2-3-3)
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 451.

CST 462 Real-Time Operating Systems
(2-3-3)
Topics in real-time operating systems analysis and design. Hard versus soft real-time systems. Scheduling paradigms and algorithms. Analysis of systems and processes. Real-time system modeling and time prediction. Prerequisite: CST 352 with grade “C” or better.

CST 464 RISC-Based Microprocessor Systems
(3-3-4)
RISC architecture and applications. Includes i960 microprocessor features, instruction set, and i960 support software. Laboratory focus on applications. Prerequisites: CST 331, CST 344.

CST 465 Web Development with ASP.NET
(2-3-3)
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 corequisites: CST 324 and CST 365 or instructor consent.

CST 466 Embedded System Security
(3-0-3)
Fundamental theories and applications of cryptography relevant to computer and embedded system security. Prerequisites: CST 126, MATH 112.

(DH) Dental Hygiene

DH 100 Introduction to Dental Hygiene I
(0-3-1)
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.
DH 101 Introduction to Dental Hygiene II  
(0-3-1)
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, DH 207, DH 307, DH 407  
Seminar  
(Hours to be arranged each term.)
Review, discussion, evaluation, and problem solving of the students’ clinical experience.

DH 221, DH 222, DH 223 Dental Hygiene Clinical Practice and Seminar I, II, III  
(221-F)(2-6-4)(222-W)(2-6-4)(223-S)(1-6-3)
Sequential courses designed to provide clinical skills essential for the practice of dental hygiene. Skill development of patient appraisal, basic instrumentation, and individualized preventive care emphasized. Special emphasis on children up to 12 years old.  
Prerequisite: For DH 221—Admission to Dental Hygiene Program.  
Prerequisite: For DH 222–DH 221.  
Prerequisite: For DH 223–DH 222 and CHE 210.

DH 226 Head and Neck Anatomy  
(2-0-2)
Head and neck anatomy correlated with clinical considerations for the dental hygienist. Anatomical nomenclature, primary and permanent dentitions, skeletal system, muscular system, head and neck structures, vascular system, nervous system, lymphatics, fascia and spaces, and spread of dental infection.  
Prerequisite: Admission in to the Dental Hygiene Program.

DH 237 Oral Histology and Embryology  
(2-0-2)
Oral histology and embryology correlated with clinical considerations for the dental hygienists. Development periods, development of oral tissues and head and neck structures and histology of hard and soft tissues of the teeth and associated structures.  
Prerequisite: DH 226.

DH 240 Prevention I  
(3-0-3)
Psychological theories pertaining to patient care. General nutrition and its impact on dental health. Understanding the body’s need for protein, carbohydrates, fats, and relation to general health.  
Prerequisite: Admission to the Dental Hygiene Program.  
Corequisite: DH 221.

DH 241 Prevention II  
(3-0-3)
Cariology, remineralization, fluorides, nutrition, xerostomia, oral physiotherapy aids, plaque, calculus, computerized dietary analysis, and counseling techniques. Healthcare for the provider is recognized as a part of holistic healthcare.  
Prerequisite: DH 240.

DH 242 Prevention III  
(3-0-3)
Preventive needs of infants through sixth grade. Sealants, early childhood caries, occlusion and nutrition, and management of this age group are considered. Healthcare for the provider is continued.  
Prerequisite: DH 241.

DH 244 General and Oral Pathology  
(3-0-3)
Introduction to general pathology and common oral pathologies. Cell pathology, inflammation, immunity, neoplasia, traumatic lesions, inflammatory lesions, oral diseases with autoimmune components, and neoplasia. Descriptive terminology and differential diagnosis will be introduced.  
Prerequisite: DH 237.

DH 252 Oral Radiology I  
(2-3-3)
Theoretical background and practical application of dental radiography. Exposure techniques, processing, mounting, and evaluation of dental radiographs; physical principles of production; clinical use of X-radiation; and radiation safety procedures.

DH 253 Oral Radiology II  
(2-0-2)
Specialized techniques for children, special needs patients, extra-oral procedures, occlusal projections, localization techniques, radiographic detection and interpretation of potential pathology.  
Prerequisite: DH 244.

DH 254 Introduction to Periodontology  
(1-0-1)
Introduction to periodontology with emphasis on etiology and pathogenesis of periodontal disease, disease classification, and assessment procedures.  
Prerequisite: DH 244.

DH 267 Emergency Procedures  
(2-1-3)
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  
(1-0-1)
Professional Ethics and legal requirements of the profession.  
Prerequisite: Admission in to the Dental Hygiene Program.

DH 299 Laboratory Practice  
(Hours to be arranged each term.)

DH 321, DH 322, DH 323 Dental Hygiene Clinical Practice and Seminar IV, V, VI  
(321-F)(1-6-3)(322-W)(1-6-3)(323-S)(2-12-6)
Continued development of dental hygiene skills, ultrasonic and advanced instrumentation, expanded functions and observation in specialty practices.  
Prerequisite: For DH 321–DH 223.  
Prerequisite: For DH 322–DH 321.  
Prerequisite: For DH 323–DH 322.

DH 340 Prevention IV  
(2-1-3)
Recognition and promotion of positive oral health habits for adolescents. Eating disorders, orthodontics, tobacco cessation, and drug/alcohol concerns and their effect on the oral cavity. Sports guard use and fabrication. Mental and physical healthcare for the provider.  
Prerequisite: DH 242.

DH 341 Prevention V  
(3-0-3)
Dental care for oral cancer patients. Examination of different antimicrobials and their use. The needs of geriatric patients and special needs patients. Healthcare for the provider.  
Prerequisite: DH 340.

Courses with the following notation fulfill the appropriate general education requirements:  
C — Communication  
H — Humanities  
SS — Social Science.

For more information see page 45.
DH 344 Advanced General and Oral Pathology  
(3-0-3)  
Common general and oral pathologic conditions, oral manifestations of systemic diseases, endocrine system disorders, autoimmune, bone, and salivary gland diseases. Emphasis will be placed on description, differential diagnosis, and treatment planning appropriate for comprehensive dental hygiene care.  
Prerequisites: DH 244 and DH 366.

DH 351 Pain Management I  
(1-3-2)  
Coordinated lecture and laboratory practice in the techniques of local anesthesia. Factors in selection of local anesthetic.  
Prerequisite: CHE 210 and DH 267.

DH 352 Pain Management II  
(2-3-3)  
Recognition of dental anxiety; behavioral management; nitrous oxide sedation techniques are practiced. Health history evaluation and case analysis.  
Prerequisite: DH 351.

DH 354 Periodontology  
(3-0-3)  
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  
(2-3-3)  
General properties, composition and manipulation of common dental materials. Expanded functions including denture relines and amalgam polishing are practiced.

DH 366 Dental Anatomy  
(2-0-2)  
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.  
Prerequisite: DH 226.

DH 370, DH 371, DH 372 International Externship  
(1-0-1)(1-0-1)(0-3-1)  
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: For DH 370–DH 321 and DH 381.  
Prerequisite: For DH 371–DH 370.  
Prerequisite: For DH 372–DH 371.

DH 380 Community Dental Health I  
(1-3-2)  
Childhood education techniques provided and implemented within the community. Systemic fluoride and its controversial effects debated. Teamwork skills.  
Prerequisite: DH 241.  
Corequisite: DH 242.

DH 381 Community Dental Health II  
(1-3-2)  
Needs assessments and budget developed along with a project plan for a community oral health project. Educating and working with adolescents. Projects will be conducted in local schools. Teamwork techniques practiced.  
Prerequisite: DH 380.

DH 382 Community Dental Health III  
(1-3-2)  
The ongoing community oral health project will be implemented. Formative and summative evaluations compared and utilized in project. The dental hygienist’s role in managed care. The various structures, ethics, and alternatives of public health.  
Prerequisite: DH 381.

DH 383 Community Dental Health IV  
(0-3-1)  
Conclusion, evaluation and future recommendations of community oral health project. Formal written presentation of project. In-depth look at geriatric clients and their needs. Students will experience different settings in the local geriatric community.  
Prerequisite: DH 382.

DH 399 Laboratory Practice  
(Hours to be arranged each term.)

DH 401 Overview of Advanced Dental Hygiene  
(3-0-3)  
Introduction to the online degree completion program. Career opportunities, roles of the dental hygienist, and the different emphases within the program are explored.
DH 470 Community Program Planning  
(2-3-3)  
Dental hygienists plan and implement a community health program. Hygienists work with contacts and resources in their community to assess, analyze, budget, plan, implement and evaluate all phases of the community health project. Requires communication skills, networking, critical thinking and research. Prerequisite: AHED 450 and admission to BDHO program.

DH 475 Dental Hygiene Research Methods I  
(2-0-2)  
Evidence-based practice is introduced. Current literature is reviewed and evaluated. Research ethics are discussed. Students write a literature review.

DH 476 Dental Hygiene Research Methods II  
(2-0-2)  
Students design and implement a pilot study. Prerequisite: DH 475.

DH 477 Dental Hygiene Research Methods III  
(2-0-2)  
Students analyze study data and document results. Prerequisite: DH 476.

DH 480 Community Health Practicum  
(0-9-3)  
Students design a community health project and gain practical experience providing dental hygiene care and education in a community group setting. Prerequisite: AHED 450, DH 470.

DH 495 Individual Studies  
(Hours to be arranged each term.)

DH 499 Laboratory Practice  
(Hours to be arranged each term.)

(DHE) Dental Hygiene, (Extended)

DHE 100 Introduction to Dental Hygiene I  
(2-0-2)  
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.

DHE 107, DHE 207, DHE 307 Seminar  
(Hours to be arranged each term.)

DHE 205 Oral and Dental Anatomy  
(3-3-4)  
Integrated anatomy, histology, and physiology of the head and neck region. Crown anatomy, root morphology and tooth development as applied to clinical situations. Lecture is to be delivered online. The lab will be at the ODS College of Dental Sciences. Offered for the ODS College of Dental Sciences only.

DHE 211 Principles of Dental Hygiene I  
(2-3-3)  
Sequential course providing theoretical background for the clinical practice of dental hygiene. Problem solving and critical thinking related to patient assessment and management. Communication skills emphasized. Offered at the ODS College of Dental Sciences only.

DHE 212 Principles of Dental Hygiene II  
(2-3-3)  
Sequential course providing theoretical background for the clinical practice of dental hygiene. Problem solving and critical thinking related to patient assessment and management. Communication skills emphasized. Offered at the ODS College of Dental Sciences only.

DHE 213 Principles of Dental Hygiene III  
(3-0-3)  
Sequential course providing theoretical background for the clinical practice of dental hygiene. Problem solving and critical thinking related to patient assessment and management. Communication skills emphasized. Offered at the ODS College of Dental Sciences only.

DHE 221 Dental Hygiene Clinical Practice I  
(0-6-2)  
Sequential course designed to provide clinical skills essential for the practice of dental hygiene. Skill development in the areas of patient appraisal, basic instrumentation, and individualized preventive care emphasized. Offered at the ODS College of Dental Sciences only.

DHE 222 Dental Hygiene Clinical Practice II  
(0-12-4)  
Sequential course providing theoretical background for the clinical practice of dental hygiene. Problem solving and critical thinking related to patient assessment and management. Communication skills emphasized. Offered at the ODS College of Dental Sciences only.

DHE 223 Dental Hygiene Clinical Practice III  
(0-12-4)  
Sequential course providing theoretical background for the clinical practice of dental hygiene. Problem solving and critical thinking related to patient assessment and management. Communication skills emphasized. Offered at the ODS College of Dental Sciences only.

DHE 227 General Pathology  
(3-0-3)  
Reaction of the human body to injury from physical, chemical, and biological agents. Inflammation, necrosis, cellular degeneration, disturbances of growth, circulation and neoplasia will be considered. Selected diseases manifesting typical symptomatology. Offered online for the ODS College of Dental Sciences only.

DHE 233 Periodontology  
(3-0-3)  
First of a two-course sequence emphasizing periodontal diseases, their classifications, and the etiological factors involved. Preventive measures within the scope and responsibility of the dental hygienist are correlated with basic sciences and clinical aspects of periodontal diseases. Offered at the ODS College of Dental Sciences only.

DHE 252 Oral Radiology I  
(2-3-3)  
Theoretical background and practical application of dental radiography. Exposure techniques, processing, mounting, and evaluation of dental radiographs; physical principles of production; clinical use of X-radiation; and radiation safety procedures. Lecture will be delivered online and the lab will be at the ODS College of Dental Sciences. Offered for the ODS College of Dental Sciences only.

DHE 253 Oral Radiology II  
(2-0-2)  
Special techniques for handicapped patients, extra-oral procedures, occlusal projections, radiographic detection, and interpretation of potential pathology. Includes introduction to use of the Panorex X-ray machine and refinement of techniques in exposure, processing, and radiographic evaluation. Offered at the ODS College of Dental Sciences only.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Description</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>DHE 261</td>
<td>Dental Health Education</td>
<td>(3-0-3)</td>
<td>An application of the concepts of preventive dentistry. Course includes oral health instruction for the individual patient based on an understanding of the causes and means to control dental disease. Selection and evaluation of oral physiotherapy aids, patient education, and other materials will be investigated. Concept of effective patient communication and motivation will be emphasized. Offered at the ODS College of Dental Sciences only.</td>
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<tr>
<td>DHE 273</td>
<td>Oral Pathology</td>
<td>(4-0-4)</td>
<td>A study of oral diseases and manifestations of systemic diseases. Utilizes an independent learning program of slides, tapes and workbook. Offered online for the ODS College of Dental Sciences only.</td>
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<tr>
<td>DHE 275</td>
<td>Dental Ethics</td>
<td>(2-0-2)</td>
<td>Professional ethics and legal requirements of the dental profession. Offered online for the ODS College of Dental Sciences only.</td>
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<tr>
<td>DHE 282</td>
<td>Medical and Dental Emergency Procedures</td>
<td>(2-3-3)</td>
<td>Equipment, drugs, signs, symptoms and treatment of medical emergencies that may occur in dental offices. Individual and team practice in carrying out emergency procedures (pulse, respiration, blood pressure, IV setup, oxygen, cardiopulmonary resuscitation, etc.) in timed simulations. Offered at the ODS College of Dental Sciences only.</td>
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<tr>
<td>DHE 299</td>
<td>Laboratory Practice</td>
<td>(Hours to be arranged each term.)</td>
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<tr>
<td>DHE 311</td>
<td>Principles of Dental Hygiene IV</td>
<td>(3-0-3)</td>
<td>Sequential course providing advanced theoretical background for the clinical practice of dental hygiene. Problem solving and critical thinking related to clinical cases. Interviewing skills, career opportunities, and alternative practice settings discussed. Community health programs evaluated. Offered at the ODS College of Dental Sciences only.</td>
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<tr>
<td>DHE 312</td>
<td>Principles of Dental Hygiene V</td>
<td>(3-0-3)</td>
<td>Sequential course providing advanced theoretical background for the clinical practice of dental hygiene. Problem solving and critical thinking related to clinical cases. Interviewing skills, career opportunities, and alternative practice settings discussed. Community health programs evaluated. Offered at the ODS College of Dental Sciences only.</td>
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<tr>
<td>DHE 320</td>
<td>Dental Materials and Chairside Assisting</td>
<td>(2-3-3)</td>
<td>A study of the general properties, composition, and manipulation of common dental materials as well as practical application of these materials at the chairside utilizing the concepts of 4-handed dentistry. Lecture is delivered online and the lab is delivered at the ODS College of Dental Sciences. Offered for the ODS College of Dental Sciences only.</td>
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<tr>
<td>DHE 321</td>
<td>Dental Hygiene Clinical Practice IV</td>
<td>(0-12-4)</td>
<td>Sequential course designed for the development of skills necessary for entry into professional clinical practice. Expanded dental hygiene functions practiced. Variety of off-campus clinical practice settings experienced. Offered at the ODS College of Dental Sciences only.</td>
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</tr>
<tr>
<td>DHE 322</td>
<td>Dental Hygiene Clinical Practice V</td>
<td>(0-12-4)</td>
<td>Sequential course designed for the development of skills necessary for entry into professional clinical practice. Expanded dental hygiene functions practiced. Variety of off-campus clinical practice settings experienced. Offered at the ODS College of Dental Sciences only.</td>
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<tr>
<td>DHE 333</td>
<td>Periodontal Therapy</td>
<td>(3-0-3)</td>
<td>Philosophy and theoretical background of advanced periodontal issues of all supportive structures are explored. Various periodontal surgery techniques are studied. Offered online for the ODS College of Dental Sciences.</td>
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<tr>
<td>DHE 351</td>
<td>Dental Analgesia</td>
<td>(2-3-3)</td>
<td>This course explores pain control methods, including local anesthesia and nitrous oxide oxygen analgesia. Health history evaluation, local and systemic complications, anesthetic solutions, and vasoconstrictors and drug interactions are discussed. Techniques of local anesthesia, including block and infiltration injections are practiced. Administration of nitrous oxide is also practiced. Prerequisites: DHE 205, DHE 282.</td>
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<tr>
<td>DHE 380</td>
<td>Oral Health Planning and Care I</td>
<td>(2-3-3)</td>
<td>A systematic approach to developing community oral health programs. Behavioral management and techniques for providing dental care for patients with special needs are emphasized within the community. Major concepts of public health including epidemiology, prevention, financing and biostatistics. Individual or group projects involving dental health education for the community. Lecture is delivered online and the lab will be at the ODS College of Dental Sciences. Offered for the ODS College of Dental Sciences only.</td>
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</tr>
<tr>
<td>DHE 381</td>
<td>Oral Health Planning and Care II</td>
<td>(2-6-4)</td>
<td>A systematic approach to developing community oral health programs. Behavioral management and techniques for providing dental care for patients with special needs are emphasized within the community. Major concepts of public health including epidemiology, prevention, financing and biostatistics. Individual or group projects involving dental health education for the community. Lecture is delivered online and the lab will be at the ODS College of Dental Sciences. Offered for the ODS College of Dental Sciences only.</td>
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<tr>
<td>DHE 399</td>
<td>Laboratory Practice</td>
<td>(Hours to be arranged each term.)</td>
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</table>
(DMS) Diagnostic Medical Sonography

DMS 107, DMS 207, DMS 307, DMS 407 Seminar
(Hours to be arranged each term.)

DMS 205 Applications of Abdominal Sonography
(3-0-3)
History of sonography. Orientation to patient history, abdominal cross-sectional anatomy, scanning, and normal sonographic presentation.
Prerequisite: MIT 103 with grade “C” or better.

DMS 211 Sonographic Instrumentation I
(3-3-4)
Orientation to sonographic equipment and imaging peripherals to stress image optimization. Principles of sonographic computer skills, biological effects, dosimetry, quality control, equipment maintenance, and safety.
Prerequisite: DMS 205 with grade “C” or better.

DMS 212 Sonographic Instrumentation II
(3-3-4)
Advanced principles of sonographic instrumentation and Doppler principles to include carotid applications, quality assurance, and preventive maintenance.
Prerequisite: DMS 211 with grade “C” or better.

DMS 224 Sonographic Abdominal Scanning I
(3-0-3)
Orientation to cross-sectional abdominal anatomy and pathology of organs and vessels. Procedures and techniques, including scanning.
Prerequisite: DMS 205 with grade “C” or better.

DMS 225 Sonographic Abdominal Scanning II
(3-0-3)
Advanced abdominal scanning procedures and techniques. Emphasis on superficial structures invasive procedures and Doppler correlation, including scanning.
Prerequisite: DMS 224, DMS 232, and DMS 253 with grade “C” or better.

DMS 231 Sonographic Physics and Instrumentation I
(3-0-3)
Orientation to physical principles with an in-depth survey to sonographic instrumentation. Principles of sound, tissue propagation, machine components, imaging peripherals, image optimization, quality assurance, equipment maintenance, and safety.
Corequisite: PHY 201.

DMS 232 Sonographic Physics and Instrumentation II
(3-0-3)
Advanced principles of sonographic instrumentation and Doppler principles to include carotid applications, hemo-dynamics, spectral analysis, color flow, energy mode, harmonic imaging, contrast agents and 3-D applications.
Prerequisite: DMS 231 with grade “C” or better.

DMS 252 Sophomore Laboratory I
(0-3-1)
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.
Corequisites: DMS 205, DMS 231, PHY 201.

DMS 253 Sophomore Laboratory II
(0-3-1)
Applied scanning of the remainder of the abdominal cavity stressing anatomy, standard imaging planes, and hard copy quality. Doppler instrumentation as applied to the cerebro-vascular system stressing pulse wave Doppler, color Doppler, Doppler optimization and standard imaging planes. Imaging review of prior anatomical areas.
Prerequisites: DMS 205, DMS 231, DMS 252, PHY 201, all with grade “C” or better.
Corequisites: DMS 232, DMS 224, BIO 335.

DMS 254 Sophomore Laboratory III
(0-3-1)
Applied scanning of small parts, musculoskeletal, superficial structures and Doppler correlation stressing standard imaging planes and hard copy image quality. MedSim abdominal applications. Imaging review of prior anatomical areas.
Prerequisites: DMS 224, DMS 232, DMS 253, all with grade “C” or better.
Corequisites: DMS 225, DMS 255.

DMS 255 Sonographic Film Analysis
(3-0-3)
Causes, correction, and prevention of specific sonographic artifacts and poor quality images. Evaluation of images.
Prerequisites: DMS 224 and DMS 232 with grade “C” or better.

DMS 316 Survey of Vascular Technology
(3-0-3)
Orientation to vascular physics, equipment, and colorflow imaging. Explanation of Doppler imaging in relation to vascular anatomy.
Prerequisite: DMS 333, DMS 335, and DMS 352 with grade “C” or better.

DMS 333 Pelvic Sonography
(3-0-3)
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 225, DMS 254, and DMS 255 with grade “C” or better.

DMS 334 Obstetrical Sonography I
(3-0-3)
Orientation to obstetrical scanning procedures and techniques. Emphasis on normal second and third trimester obstetrical anatomy and fetal embryology.
Prerequisite: DMS 333, DMS 335, and DMS 352 with grade “C” or better.

DMS 335 Diagnostic Medical Sonography Patient Care
(3-0-3)
Sonographic management and applications of cognitive, psychomotor, and interpersonal skills as they relate to the health care consumer. Patient assessment and communication, body mechanics, medical and surgical asepsis, medical emergencies, pharmacology, and analysis of ethical and legal issues.
Prerequisites: DMS 225, DMS 254, and DMS 255 with grade “C” or better.

DMS 337 Breast Sonography
(3-0-3)
Breast sonographic scanning procedures with an emphasis on 2D, 3D, 4D, panoramic, Doppler, color Doppler and Invasive applications. Correlation with mammography, MRI, and other imaging modalities.
Prerequisite: DMS 225 with grade “C” or better.
DMS 341 Echo Instrumentation  
(3-0-3)  
Echo equipment, 2-D, M-Mode, PW, CW, and Color Doppler instrumentation. Adult 2-D echocardiographic anatomy, electrophysiology, and EKG placement. Prerequisite: DMS 255 with grade "C" or better.

DMS 342 Adult Echo  
(3-0-3)  
Parasternal, apical, subcostal, and suprasternal 2-D views. Standard M-Mode measurements, Doppler, and Color Doppler. Common cardiac pathology. Prerequisite: DMS 341 with grade "C" or better.

DMS 343 Fetal Echo and Neonatal Sonography  
(3-0-3)  
Fetal cardiac development and normal anatomy. Fetal echocardiographic 2D views, M-Mode, Doppler, and Color Doppler. Common fetal cardiac pathology and anomalies. Neonatal topics include hip and neurological sonographic applications. Prerequisite: DMS 334.

DMS 344 Obstetrical Sonography II  
(3-0-3)  
Advanced obstetrical scanning of second and third trimester obstetrical patients with emphasis on pathology. Prerequisite: DMS 334 with grade "C" or better.

DMS 346 Musculoskeletal Sonography  
(3-0-3)  
Musculoskeletal sonographic scanning procedures with an emphasis on shoulder, wrist and knee applications. Correlation with other imaging modalities. Prerequisite: DMS 225 with grade "C" or better.

DMS 352 Junior Laboratory I  
(0-3-1)  
Applied scanning of the male and female pelvis stressing anatomy, standard imaging planes, and hard copy quality. MedSim pelvic, endovaginal and first trimester applications. Imaging review of prior anatomical areas. Prerequisites: DMS 225, DMS 254, and DMS 255, all with grade "C" or better. Corequisites: DMS 333, DMS 335.

DMS 353 Junior Laboratory II  
(0-3-1)  
Applied scanning of normal first, second, and third trimester stressing anatomy, standard imaging planes, and image quality using the MedSim systems. Doppler examination of the carotid and lower extremity systems. Imaging review of prior anatomical areas. Prerequisites: DMS 333, DMS 335, and DMS 352, all with grade "C" or better. Corequisites: DMS 316, DMS 334.

DMS 354 Junior Laboratory III  
(0-3-1)  
Applied scanning of abnormal first, second, and third trimester scanning on the MedSim systems stressing pathology and additional imaging requirements. Final competencies of all prior imaging areas stressing image quality. Prerequisites: DMS 334, DMS 335, DMS 353, all with grade "C" or better. Corequisites: DMS 344, DMS 365.

DMS 365 Sonographic Pathology  
(3-0-3)  
Differential diagnosis and concepts of disease processes as applied to sonographic examination. Prerequisite: DMS 334 with grade "C" or better.

DMS 388 Externship Preparation  
(2-0-2)  
Presentation of key concepts related to Diagnostic Medical Sonography externship and required 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 334, DMS 316 and DMS 353 with grade "C" or better. Corequisites: DMS 344, DMS 365 and DMS 365.

DMS 430 Diagnostic Medical Sonography Externship  
(0-40-15)  
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. Prerequisites: All academic coursework in the Diagnostic Medical Sonography curriculum.

(ECHO) Echocardiography

ECHO 107, ECHO 207, ECHO 307, ECHO 407 Seminar  
(Hours to be arranged each term.)

ECHO 225 Cardiopulmonary Patient Management Practices  
(2-3-3)  
Current issues in the practice of echocardiography with emphasis on the technologist’s responsibilities to the patient, the patient’s family and the professions of echocardiography. Transporting critically ill patients and recognizing emergency situations. Prerequisite: ECHO 231. Corequisites: ECHO 232, ECHO 332.

ECHO 227 Basic ECG Recognition and Testing  
(3-0-3)  
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  
(3-3-4)  

ECHO 232 Echocardiography II  
(3-3-4)  
An intermediate level of instruction in scanning techniques and tomographic views according to the American Society of Echocardiography standards. Emphasis on cardiac pathology and the echocardiography evaluation. Prerequisite: ECHO 231, BIO 347, VAS 210. Corequisites: ECHO 225, ECHO 332, VAS 211.

ECHO 320 Cardiographic Methods  
(3-3-4)  
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. Prerequisite: MIT 103 with grade "C" or better. Corequisite: BIO 220.
ECHO 321 Stress and Transesophageal Echo
(3-0-3)
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.
Prerequisites: ECHO 225, ECHO 232, ECHO 332, VAS 211.
Corequisite: ECHO 333.

ECHO 325 Pediatric Echocardiography
(3-0-3)
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.
Prerequisites: ECHO 321, ECHO 333.
Corequisites: CHE 210, ECHO 376.

ECHO 332 Invasive Cardiology
(3-0-3)
Cardiac catheterization testing. Coronary artery interventions such as percutaneous coronary intervention (PCI) and chamber pressure measurements.
Prerequisite: BIO 347, ECHO 231, VAS 210.
Corequisites: ECHO 225, ECHO 232.

ECHO 333 Echocardiography III
(3-3-4)
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.
Prerequisites: ECHO 225, ECHO 232, ECHO 332 and VAS 211.
Corequisite: ECHO 321.

ECHO 334 Echocardiography IV
(3-3-4)
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.

ECHO 365 Abdominal/Renal Testing
(3-3-4)
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, ECHO 376.
Corequisites: ECHO 385, ECHO 388.

ECHO 376 Survey of Vascular Testing
(3-0-3)
Basic vascular pathophysiology in carotid, arterial, and venous testing. Waveform recognition, interpretation, and protocols for testing.
Prerequisites: ECHO 321, ECHO 333.
Corequisites: CHE 210, ECHO 325.

ECHO 385 Echocardiography Laboratory Management
(3-0-3)
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.
Corequisites: ECHO 365, ECHO 388.

ECHO 388 Externship Preparation
(2-0-2)
Review and summarization of key concepts in Echocardiography. Focus is on patient care and interpersonal scenarios the externship student will likely face while in the hospital environment or independent echo lab. Review and discussion of the Echocardiography Externship Handbook.
Prerequisites: ECHO 325, ECHO 376.
Corequisites: ECHO 365, ECHO 385.

ECHO 420Echocardiography Externship
(0-40-15)
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 Echocardiography Degree Completion Program.

ECHO 421 Echo Senior Project
(4-0-4)
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; WRI 123 or WRI 227.

(eco) Economics

ECO 107, ECO 207, ECO 307, ECO 407 Seminar
(Hours to be arranged each term.) SS

ECO 201N Principles of Economics, Microeconomics
(3-0-3) SS
Topics include scarcity, consumer choice, supply and demand, elasticity, cost and pricing theory, theory of market structures (competition, monopoly, monopolistic competition, oligopoly). Pre- or corequisite: MATH 105 or MATH 111.

ECO 202N Principles of Economics, Macroeconomics
(3-0-3) SS
An introduction to the economic problem. Topics include gross domestic product, unemployment, monetary policy, fiscal policy, macro equilibrium, inflation, and supply and demand. Pre- or corequisite: MATH 105 or MATH 111.

ECO 203 Principles of Economics, Special Topics
(3-0-3) SS
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 201N, ECO 202N.
ECO 357 Energy Economics and Policy 
(3-0-3) SS
Explores the role of energy and energy resources from the economic perspective. Analyzes U.S. 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 201N or ECO 202N, and MATH 243 or MATH 361.

ECO 367 International Economics and Finance Management 
(4-0-4) SS
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 diversification; international banking; capital budgeting; political risk evaluation of performance. Prerequisites: BUS 308 and ECO 201N or ECO 202N.

(EE) Electrical Engineering

EE 101, EE 102, EE 103 Introduction to Engineering I, II, III 
(0-3-1) (0-3-1) (0-3-1) 
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 107, EE 207, EE 307, EE 407 Seminar 
(Hours to be arranged each term.)

EE 131 Digital Electronics I – Combinational Logic 
(3-3-4) 
Introduction to combinational logic, Gates, Boolean Algebra, Karnaugh mapping, number systems/codes, arithmetic circuits, decoders/encoders, Mux/DeMux, comparators, parity, code conversion, introduction to HDL, PLD HW implementation. Prerequisite: Placement in MATH 111 or higher.

EE 133 Digital Electronics II – Sequential Logic 
(3-3-4) 
Introduction to sequential logic, latches, flip/flops, timers, counters/registers, HDL implementation, PLD HW implementation, finite state machine design/analysis, logic testing, DC parameters and timing analysis. Student must register for laboratory section. Prerequisite: EE 131 with grade “C” or better, MATH 111.

EE 221 Circuits I – DC and 1st Order Transient Analysis 
(3-3-4) 

EE 223 Electric Circuits II – AC and 2nd Order Transient Analysis 
(3-3-4) 

EE 225 Circuits III – Laplace Transforms and Applications 
(3-3-4) 
Introduction to the Laplace Transform. Circuit Analysis using the Laplace Transform. Passive Filters. Active Filters. Frequency Response and Bode Plots. Two-Port Circuits. Student must register for a laboratory section. Prerequisite: EE 223 with grade “C” or better, MATH 321.

EE 236 LabVIEW Programming 
(3-3-4) 
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 301 Optoelectronics I – Optoelectronic Devices and Optical Detection 
(3-3-4) 
Optoelectronic devices including polarizers, retarders, filters, modulators, monochromators, lock-in amplifiers. Propagation of radiation through optical systems. Optical detectors including photovoltaic and photoconductive devices, pyroelectric detectors, linear and area arrays. Photodetector noise, and post-detection electronic amplifiers and filters. Student must register for a laboratory section. Prerequisites: MATH 253N, PHY 223.

EE 303 Optoelectronics II – Lasers 
(3-3-4) 
Laser radiation properties, laser cavities, coherence, atomic spectra, pumping rate, power gain, threshold conditions, resonator stability, beam shape, mode structure, beam modification with intracavity elements. Study of ion, molecular, solid-state, dye and semiconductor lasers. Student must register for a laboratory section. Prerequisite: EE 301 with grade “C” or better.

EE 305 Optoelectronics III – Fiber Optic Principles and Applications 
(3-3-4) 
Light propagation in fibers, fiber types, fiber manufacture, light sources, optical detectors. Termination, coupling, and splicing of fibers. Introduction to fiber optic communication and sensors. Fiber devices, optical time domain reflectometry, fiber amplifiers, fiber lasers, and fiber sensors. Student must register for a laboratory section. Prerequisite: EE 341, EE 301 both with grade “C” or better.

EE 311 Signals and Systems 
(3-3-4) 
Course Descriptions

EE 321 Electronics I – Introduction to Amplifiers and Semiconductor Devices
(4-3-5)
Prerequisite: EE 223 with grade “C” or better.

EE 323 Electronics II – Transistor Amplifiers and Analog ICs
(4-3-5)
Prerequisite: EE 321 with grade “C” or better.

EE 325 Electronics III – Analog IC Applications
(4-3-5)
Prerequisites: EE 225 and EE 323, both with grade “C” or better.

EE 331 Digital System Design with HDL
(3-3-4)
Introduces the student to a Hardware Description Language and describes its role in Digital System Design. Behavioral and structural modeling, ROMs, PLAs, PALs, CPLDs and FPGAs. ASM charts and Design examples including keyboard scanner, counters, ALUs, multipliers, and controllers. Student must register for a laboratory section.
Prerequisite: CST 133 with grade “C” or better.

EE 333 Microcontroller Engineering
(3-3-4)
Microcontroller engineering using popular microcontroller, internal structures and control units, timing, interrupts and memory interfacing, assembly language programming specific to microcontroller, on-chip peripheral devices. Student must register for a laboratory section.
Prerequisite: EE 331 with grade “C” or better.

EE 335 Advanced Microcontroller Engineering
(3-3-4)
Second course Microcontroller Engineering, further use programmable microcontroller peripherals, A/D conversion, PWM, synchronous serial. Student must register for a laboratory section.
Prerequisite: EE 333 with grade “C” or better.

EE 341 Electricity and Magnetism with Transmission Lines
(4-0-4)
Prerequisites: EE 221 with grade “C” or better; MATH 254N and PHY 222.

EE 343 Solid-State Electronic Devices
(3-0-3)
Prerequisite: PHY 222.

EE 347 Digital Logic
(3-3-4)
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 401 Communication Systems
(4-3-5)
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. Student must register for a laboratory section.
Prerequisites: EE 341 with grade “C” or better; MATH 465.

EE 411, EE 412, EE 413 Senior Project I, II, III
(1-3-2)(0-6-2)(0-6-2)
A three-term sequence integrating electrical engineering design, group dynamics, and technical communications. Multidisciplinary student teams will be introduced to a major electrical engineering project, ideally supplied by an industrial client working in health-related technologies, optoelectronics or renewable energy engineering. The final term will culminate in a formal written proposal. Student teams will perform engineering design work as defined in the proposal during the second and third terms. The final design and recommendations will be presented orally and in a comprehensive final report. Entire sequence must be completed in three consecutive terms. Student must register for a laboratory section.
Prerequisite: Senior standing in EE.
Corequisites: WRI 321, WRI 322, WRI 323.

EE 419 Power Electronics
(3-3-4)
Power transistor characteristics. Power devices; SCRs, Power MOS, IGBTs, DIACS, TRIacs. Large signal amplifiers. Voltage regulators, switching regulators. Drive and snubber circuits. Photodiodes, optocouplers. Thermal de-rating, thermal modeling. Student must register for a laboratory section.
Prerequisite: EE 321 with grade “C” or better.

EE 421 Analog Integrated – Circuit Design
(4-3-5)
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 a laboratory section.
Prerequisite: EE 325 and EE 343, both with grade “C” or better.

For more information see page 45.
EE 423 CMOS Digital Integrated – Circuit Design  
(3-3-4)  
MOSFETs (n and p), threshold voltage, body effect, channel length, mobility, MOS models (three/four terminal), CMOS inverter (transfer eqns, aspect ratio), transmission gate, IO structures, CMOS processing, CMOS technology, circuit performance ( latch-up, parameter estimations, delay models), design/layout. Student must register for a laboratory section. Prerequisite: EE 311, EE 321 both with grade “C” or better.

EE 425 Wireless Communication  
(3-3-4)  
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 a laboratory section. Prerequisites: EE 311, EE 325, both with grade “C” or better.

EE 431 Digital Signal Processing  
(3-0-3)  
Discrete systems and signals, linear time invariant systems, difference equations, frequency response, Z-transforms, analysis software, discrete Fourier transforms. Prerequisite: EE 311, EE 335, both with grade “C” or better.

EE 441 Biomedical I – Introduction to Biomedical Engineering  
(3-3-4)  
Introduction to biomedical engineering, anatomy and physiology for engineers, bioelectric phenomena, biomedical sensors, biomedical instrumentation, biosignal processing, cardiovascular mechanics, biomatertials, 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 Processing  
(3-3-4)  
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  
(3-3-4)  
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 456 Control System Design  
(2-3-3)  
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. Student must register for a laboratory section. Prerequisite: EE 225, EE 321 both with grade “C” or better.

EET 101 Introduction to Circuit Analysis  
(3-0-3)  
International system of units; engineering notation and prefixes; definitions of current, voltage, resistance, power, work and efficiency; Ohm’s and Kirchhoff’s laws; series and parallel circuit principles; series-parallel DC resistive networks. Corequisites: EET 102, MATH 100.

EET 102 Introduction to Circuit Analysis Laboratory  
(0-3-1)  

EET 107, EET 207, EET 307, EET 407 Seminar  
(Hours to be arranged each term.)

EET 115 Network Theorems and Transient Analysis  
(3-0-3)  
Current sources; source conversion; Thevenin, Norton and superposition theorems; capacitance; magnetic; inductance; transient analysis of RC and RL circuits. Prerequisite: EET 101 with grade “C” or better. Corequisites: EET 116, MATH 111.

EET 116 Network Theorems and Transient Analysis Laboratory  
(0-3-1)  
Theoretical concepts covered in EET 115 verified using available components and instrumentation. Prerequisite: EET 102. Corequisite: EET 115.

EET 125 AC Circuit Analysis  
(4-0-4)  
Sinusoidal AC voltage, phasors, average and effective values, impedance, AC series parallel circuits, AC power, AC network analysis, AC network theorems, dependent sources, transformers. Prerequisite: EET 115 with grade “C” or better. Corequisite: MATH 112.

EET 126 AC Circuit Analysis Laboratory  
(0-6-2)  
Theoretical concepts discussed in EET 125 verified using available components, instrumentation, and computer simulations using PSPICE. Prerequisite: EET 116 with grade “C” or better. Corequisite: EET 125.

EET 143 DC and AC Circuit Fundamentals  
(5-0-5)  
Network theorems applied to DC circuits: source conversions, Thévenin, Norton, superposition; capacitance; magnetic circuits; inductance; transient analysis of RC and RL circuits; sinusoidal waveforms; phasors; reactance and impedance; series, parallel, and series-parallel AC circuits. Prerequisite: EET 101 with grade “C” or better. Corequisites: EET 144 or EET 146; MATH 112.

EET 144 DC and AC Circuit Fundamentals Laboratory for LOET  
(0-3-1)  
Laboratory companion to EET 143 for LOET majors only. This course will not count for EET or CSET majors. Theoretical concepts covered in lecture will be verified using available components and instruments. This course must be taken the same term as EET 143. Written laboratory reports are required. Prerequisite: EET 102 with grade “C” or better. Corequisite: EET 143.

Courses with the following notation fulfill the appropriate general education requirements:  C – Communication  H – Humanities  SS – Social Science.  
For more information see page 45.
EET 209 Introduction to Amplifiers and Semiconductor Devices
(4-0-4)

EET 210 Introduction to Amplifiers and Semiconductor Devices Laboratory
(0-6-2)
Theoretical concepts discussed in EET 209 verified using available components and instrumentation. Computer simulation using PSPICE. Prerequisite: EET 126 with grade “C” or better. Corequisite: EET 209.

EET 235 Transistor Amplifiers
(4-0-4)

EET 236 Transistor Amplifiers Laboratory
(0-6-2)

EET 237 AC Circuits, Filters and Signals
(3-0-3)
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. Prerequisite: EET 115 with grade “C” or better, Math 252. Corequisite: EET 238.

EET 238 AC Circuits, Filters and Signals Laboratory
(0-3-1)
Lab to accompany EET 237. For non-EET majors. Prerequisites: EET 115 with grade “C” or better, Math 252. Corequisite: EET 237.

EET 243 Introduction to Digital Concepts
(3-0-3)
Digital concepts covering Boolean algebra, algebraic simplification, number systems, and various combinational circuit elements (AND, OR, XOR, NAND, NOR gates). Combinational circuit implementation using NAND gates, NOR gates, decoders, encoders, multiplexers, and demultiplexers. Karnaugh Maps are used in the synthesis of combinational circuits. Prerequisite: EET 125. Corequisite: EET 244.

EET 244 Introduction to Digital Concepts Laboratory
(0-3-1)
Circuits will be built using integrated circuits to reinforce the theoretical concepts discussed in EET 243. Computer simulation. Prerequisite: EET 126. Corequisite: EET 243.

EET 245 Digital Logic
(3-0-3)
Combinational logic design using multiplexers, decoders, ROMs, and PLAs. Sequential circuit elements (flip-flops) presented along with applications such as counters and registers. Basic TTL and CMOS circuits analyzed. Prerequisite: EET 243. Corequisite: EET 246.

EET 246 Digital Logic Laboratory
(0-6-2)
Combinational and sequential designs built using SSI, MSI, and LSI integrated circuits. Circuits tested and simulated. Prerequisite: EET 244. Corequisite: EET 245.

EET 249 Digital Logic Laboratory for LOET
(0-3-1)
Laboratory companion to EET 245 for LOET majors only. This course will not count for EET or CSET majors. Theoretical concepts covered in lecture will be verified using available components and instruments. This course must be taken the same term as EET 245. Written laboratory reports are required. Prerequisite: EET 244. Corequisite: EET 245.

EET 251 Amplifier Frequency Response
(4-0-4)
Bode Plots, effects of coupling and bypass capacitors, design of BJT and FET amplifiers, design of wideband amplifiers, tuned-circuit techniques, series and parallel resonance, tuned amplifiers, crystal-controlled oscillators. Prerequisite: EET 235. Corequisite: EET 266.

EET 252 AC Analysis Laboratory
(0-6-2)

EET 266 Amplifier Frequency Response Laboratory
(0-6-2)

EET 275 Power Amplifiers and Special Devices Laboratory
(0-6-2)

EET 281 Topics in Network Analysis
(3-0-3)
Network theorems and techniques for direct and alternating currents. Transfer function analysis. Frequency response of circuits. Designed for community college transfer students. Prerequisite: Department approval. Corequisite: MATH 251.

EET 283 Topics in Digital Circuits
(2-3-3)
Courses with the following notation fulfill the appropriate general education requirements:

- Communication (C)
- Humanities (H)
- Social Science (SS)

For more information see page 45.

**EET 285 Topics in Analog Devices and Circuits**

- Analysis of AC small and large signal conditions for bipolar junction field-effect transistors and MOS field effect devices. Frequency effect of single stage amplifiers. Multistage amplifier circuits. Designed for community college transfer students.
- Prerequisite: Department approval.
- Corequisites: MATH 251, EET 286.

**EET 286 Topics in Analog Devices and Circuits Laboratory**

- Laboratory companion to EET 285. Theoretical concepts discussed in lecture will be verified using available components and instrumentation. Must be taken during the same term with EET 285. Designed for community college transfer students.
- Prerequisite: Department approval.
- Corequisite: EET 285.

**EET 298 Reading and Conference**

- Hours to be arranged each term.

**EET 299 Laboratory Practice**

- Hours to be arranged each term.

**EET 308 Introduction to MOS Microelectronics**

- 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: EET 245 or EET 237 and CST 262 or instructor consent.
- Corequisite: EET 309.

**EET 309 Introduction to MOS Microelectronics Laboratory**

- 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: EET 246 or EET 238 and CST 262 or instructor consent.
- Corequisite: EET 308.

**EET 319 Fundamentals of Microwave and RF Technology**

- Introductory topics in the field of microwave. Transmission lines (wave propagation, losses, reflected waves, and standing waves), Smith Charts, waveguides, microstrip circuits, and s-parameters are covered. Problem solving will use tools such as Smith Charts and software packages.
- Prerequisite: EET 373.
- Corequisite: EET 472.

**EET 340 Optics**

- A course in geometrical and wave optics. Topics in reflection and refraction at plane and curved surfaces; imaging properties of lenses; paraxial ray tracing of optical systems; superposition; interference; interferometers; diffraction; polarization; scattering.
- Prerequisites: PHY 223, MATH 252.

**EET 348 Senior Project: Individual Project Proposal**

- Selection, definition, and analysis of a problem suitable for senior project prior to actual project development. Includes consideration of project parameters and implications, proposal of alternate solutions, and justification of selected solution. Culminates in writing of project proposal.
- Prerequisites: EET 363, EET 373.
- Corequisites: WRI 321, EET Department approval.

**EET 361 Digital Systems I**

- State machine design including state reduction and state assignment. Sequential circuit analysis. Digital system implementation using MSI devices such as ROMs and PLDs. Asynchronous state machines analyzed and designed. Computer circuits and memory elements used.

**EET 362 Digital Systems II**

- Design digital systems using programmable devices as well as conventional building blocks. System controllers designed using state tables, ASM charts and VHDL. Laboratory explorations and projects of theoretical concepts.

**EET 363 Introduction to Microcontrollers**

- A study of Motorola 68HC12 microcontroller. Internal structure, registers, busses, control units. Clock, machine and instruction cycle timing, interrupts and DMA. Instruction set, mnemonics, functions and assembly language programming. Interfacing to external memory and I/O on chip peripherals. Laboratory explorations and projects of theoretical concepts.

**EET 364 Microcontroller Systems**

- Advanced features of Motorola 68HC12 Microcontroller System environment with the external memory and peripheral devices. Advanced numerical routines. Digital control systems, displays, transducers. Laboratory explorations and projects of theoretical concepts.

**EET 371 LaPlace Transforms and Applications**

- Applications of LaPlace in first and second order networks; poles, zeros and stability in S-plane; active filters and oscillators. Laboratory explorations and projects of theoretical concepts.

**EET 373 Operational Amplifiers and Applications**

- Properties, modeling and analysis of feedback systems using the operational amplifier. Stability and frequency compensation of operational amplifiers. Oscillators, nonlinear circuit applications, Schmitt trigger, analog switches, peak detectors and sample and hold. A/D and D/A conversion techniques. Laboratory explorations and projects of theoretical concepts.

**EET 405 Reading and Conference**

- Hours to be arranged each term.

**EET 408 Workshop**

- Hours to be arranged each term.

**EET 413 Data Communications**

- Principles and techniques of analog to digital conversion; encoding digital data; fundamentals of transmission media; error detection and correction; transmission protocols; multiplexing techniques; time, frequency and code division multiplexing; switching concepts; packet switching, frame relay and asynchronous transfer mode.
- Prerequisite: Senior standing in EET.
EET 415 Telecommunications I  
(2-3-3)  
Introduction to telecommunications. Electromagnetic wave propagation in free space, antennas, line of sight transmission (directive gain, beam width, polarization, impedance), RF components (amplifiers, mixers, up-converters), receivers, and transmitters. Laboratory assignments and demonstrations include antenna gain and field strength. Prerequisite: EET 319.

EET 416 Microwave and RF Amplifier Design  
(3-0-3)  
An introduction to the design of amplifiers in the frequency range of one half to ten gigahertz. Impedance matching, modeling, dynamic range, unilateral design, bilateral design, stability, low noise design, and broadband design techniques. Students will use software to perform impedance matching, Smith chart plotting, and simulation. Prerequisite: EET 415.

EET 421 Active Filter Design  
(3-0-3)  
An introduction to the design and analysis of active filters including Butterworth, Chebychev, Bessel, and Elliptic filters. Low-pass through band-pass filters are covered. The course includes one hardware and one software project. Prerequisite: EET 371. Corequisite: EET 373.

EET 423 ASIC Design I Senior Project  
(2-3-3)  
An introduction to various aspects of the design of an ASIC (Application Specific Integrated Circuit) and to new industry trends both in digital and analog design. Laboratory demonstrations and experiments with a complete EDA (Electronics Design Automation) software package. Senior project proposal required. Prerequisites: EET 361 and EET 373. Pre- or corequisites: EET 464 and EET 473.

EET 425 Telecommunications II  
(2-3-3)  
Baseband digital systems; messages, characters and symbols; review of sampling theorems and discrete vs continuous signals; noise sources in digital communications system; M-ary signals; baseband formatting including PCM waveforms; digital filters, including FIR and IIR, raised cosine filters, matched filters; bandpass modulation and demodulation techniques; spectrum transmission. Prerequisite: EET 415.

EET 433 ASIC Design II Senior Project  
(1-6-3)  
Advanced topics in ASIC design: behavioral description languages, timing in digital design, design for testability, fault simulation. Field Programmable Logic Devices (FPGA). Simulation and prototyping of the senior project with FPGAs. Senior project report required. Prerequisite: EET 423.

EET 435 Telecommunications III  
(0-9-3)  
A capstone course in telecommunications. Students will propose, design and construct/simulate a solution to some telecommunications problem or issue. The student will research vendor data books, application notes, articles and texts to support the design of a telecommunications related circuit, module, or system. A final paper will be written and presented to a faculty board. Prerequisites: EET 415, EET 425, EET 455.

EET 436 Optoelectronic Devices  
(3-3-4)  
An introduction to devices commonly used in opto-electronics. Devices and instruments studied include photodiodes, polarizers, retarders, filters, modulators, monochromators, integrating spheres and lock-in amplifiers. Prerequisite: EET 373.

EET 437 Optical Detection  
(3-3-4)  
Propagation of optical radiation through optical systems. UV and visible optical detectors including photovoltaic and photoconductive detectors, pyroelectric detectors, linear and area arrays. Noise in photo detectors. Post detection electronic amplifiers and filters. Prerequisites: EET 436, MATH 254N.

EET 443 ASIC Design III Senior Project  
(0-9-3)  
Completion of an integrated circuit design. Creation of an IC prototype in FPGA or/and a file for fabrication in silicon. Final report containing project documentation required. Prerequisite: EET 433.

EET 445 Optical Fibers  
(3-3-4)  
Theory and practice of light propagation in optical fibers, light sources, types of optical fiber, optical detectors. Termination, coupling and splicing of optical fibers. Prerequisites: EET 436, MATH 254N.

EET 447 Topics in Optoelectronics  
(0-3-1)  
A course designed to give the student additional capabilities with a variety of optics systems and instrumentation. Possible topics include large optics, optical arrays, Fresnel optics, interferometers, spectrometers, thin films and coatings, polarization. All topics to be investigated in a lab setting. Pre- or corequisite: EET 436.

EET 454 Automated Test Engineering I  
(2-3-3)  
An introduction to Automated Test Engineering (ATE). Topics include: measurement techniques for ATE instruments, measurement errors, and software used to control automated instruments. The IEEE-488 bus is also discussed. Students will complete a group term project. Prerequisites: CST 116, EET 363, EET 373.

EET 455 Digital System Design  
(3-0-3)  

EET 458 Senior Project: Individual Project Design  
(1-3-2)  
A continuation of EET 358 with emphasis on manufacturer and vendor contact resulting in verification and implementation of proposal tradeoffs in support of prototype design and construction. Prototype construction of project solution begins. Report produced on design calculations and functional analysis of hardware and/or software needed for project solution. Prerequisite: EET 358. Corequisite: WRI 322.

EET 459 Digital Signal Processing II Senior Project  
(3-0-3)  
Analysis and synthesis of digital signal processing systems including the following topics: nonrecursive and recursive filters; hardware accelerators; digital speech processing. Most of the homework will be done using special applications software running on PC based work stations. DSP project proposal. Prerequisite: EET 471.
EET 461 Optoelectronic Principles  
(3-0-3)  
A course to investigate the physics associated with a variety of commonly used optical devices. Solid-state physics required to understand function of optical devices such as detectors, solid-state lasers, and optical modulators. Quantum aspects of optics leading to the understanding of photo-emissive devices, optical radiation and laser dynamics. Prerequisites: PHY 223, MATH 254N.

EET 462 Lasers  
(3-3-4)  
Laser radiation properties, laser cavities, coherence, atomic spectra, Boltzmann statistics, pumping rate, power gain, threshold conditions, resonator stability, beam shape, mode structure, beam modification with intracavity elements. Prerequisite: EET 461.

EET 463 Quality Assurance and Reliability  
(3-0-3)  
Inspection and testing for quality control of electronic circuits and systems. Statistical evaluation of mean-time-between-failure. Sampling plans, analysis of variance, evaluation of reliability. Device and system test objectives and schemes. Case studies in quality control. Prerequisites: Senior standing, MATH 254N.

EET 464 Automated Test Engineering II  
(2-3-3)  
A continuation of EET 454. Topics include: measurement techniques and error in digital circuits, IEEE-488 and VXI bus structures, design for test and test error analysis. Course includes a group term project. Prerequisite: EET 454.

EET 465 Optoelectronic Applications  
(3-3-4)  
A course designed to further the knowledge and capabilities of the optoelectronics student in fields of interest. Possible areas of study include: Optical Testing, Fourier Optics, Holography, Crystal Optics, Laser Systems and Fiber Optic Systems. Prerequisites: EET 462, EET 436, EET 437.

EET 467 Modern Control Systems  
(3-0-3)  
Analysis and application of modern control system theory in selected areas of electronics, industrial process control, and other systems. The phase-lock-loop is analyzed as the introductory example of a control system application. S and Z transforms are developed in control system contexts. Prerequisites: EET 373, MATH 321.

EET 468 Senior Project: Individual Project Evaluation  
(1-12-5)  
A project laboratory (continuation of EET 458). Project proposed in EET 358 and designed in EET 458 will be constructed, tested, evaluated and packaged. Complete documentation with performance specifications, functional description, design calculations, test results, schematics, performance graphs, flowcharts, parts lists, wiring diagrams, and photographs become part of the complete senior project final report. The student will defend his/her project before a review panel that will consist of the senior project adviser, another technically qualified panelist and a third person of the student’s choice. Prerequisite: EET 458. Corequisite: WRJ 323.

EET 469 Digital Signal Processing III  
Senior Project  
(0-9-3)  
Digital Signal Processing senior projects defined in EET 459 will be designed and implemented. The projects will generally include both hardware and software. A final paper will be written and an oral presentation given. Prerequisite: EET 459.

EET 471 Digital Signal Processing  
(4-3-5)  
Analysis of discrete systems and signals including the following topics: discrete signals; linear time invariant systems, difference equations, frequency response, Z transforms. Analysis software applied to solutions. Discrete Fourier transforms. Spectral analysis. Laboratory explorations and projects of theoretical concepts.

EET 472 Communication Systems  
(4-3-5)  
Fourier series and transforms. System noise sources and definitions. Amplitude, frequency and phase modulation. Principles of superheterodyne receivers. Transmitter circuits and phase lock loop. Digital modulation techniques such as FSK, PSK and QPSK. Laboratory explorations and projects of theoretical concepts.

EET 473 Analysis and Design of Analog Integrated Circuits  
(4-3-5)  
The properties, modeling and analysis of bipolar and field effect transistor circuits commonly found in analog integrated circuits. Topics include high frequency effects, multistage circuits, active loads, output stages and the design of a complete integrated circuit operational amplifier. Laboratory explorations and projects of theoretical concepts.

EET 476 Optoelectronics Senior Project  
(1-6-3)  
Capstone course in optoelectronics. Students will propose, design and construct an optoelectronics circuit, module or system. Prerequisites: EET 447, EET 465.

Emergency Medical Technology—Paramedic (EMS)  

EMS 107, EMS 207 Seminar  
(Hours to be arranged each term.)

EMS 115 Introduction to EMS  
(2)  
An overview of EMS including history, EMS systems design, legal considerations, medical ethics, roles and responsibilities of the paramedic, national, state, county and private EMS organizations, legislation, communication systems and biomedical informatics. Includes future trends of health care delivery, introduction to continuous quality improvement, management and research in EMS.

EMS 200 Medical Terminology  
(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 211 Prehospital Emergency Pharmacology  
(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 Assessment and Management  
(3)  
Introduction to kinematics of trauma, and rescue techniques. Pathophysiology, assessment, and management of fluids and shock, CNS injuries, soft tissue injuries, burns, extremity injuries, spinal immobilization, control of hemorrhage and unique considerations in geriatric, pediatric and pregnant patients. Includes completion of Prehospital Trauma Life Support Course.
EMS 231 Medical Emergencies I  
(3)  
The first in a series of three, this course discusses the cardiac and pulmonary related emergencies including the pathophysiology, assessment and management; arterial blood gases, acid base balance; airway and ventilation, basic and advanced airway management techniques and the differential diagnosis of cardiac and pulmonary diseases.

EMS 232 Medical Emergencies II  
(4)  
Course content includes the pathophysiology, assessment and management of neurological, abdominal/genitourinary and endocrine emergencies. Students learn to assess and manage normal and abnormal obstetric patients, as well as neonate and pediatric patients.  
Prerequisite: EMS 231.

EMS 233 Medical Emergencies III  
(3)  
The third in a series of medical emergency courses, this course focuses on the pathophysiology, assessment, emergency management and prevention of toxicology, psychiatric and environmental emergencies. In addition students will learn specific considerations for geriatric patients, abuse victims, physically challenged and chronic care patients.  
Prerequisite: EMS 232.

EMS 235 Basic Electrocardiography  
(2)  

EMS 236 Advanced Electrocardiography  
(2)  
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 Geriatric Seminar Series  
(3)  
A conjoint, interdisciplinary course designed to introduce health care profession students to the aging patient. Six evening sessions conducted at OHSU cover topics including successful aging, the senses and aging, maintaining mobility, mental health issues, family caregiving, elder abuse, community resources, and common problems associated with aging.

EMS 271 EMT–Paramedic Skills Laboratory Part I  
(2)  
Offers the first part of a two-term course. Reviews EMT–Basic skills. Students learn and practice skills included in the EMT-Paramedic scope of practice. Advanced life support skills offered in part include advanced patient assessment skills, airway and intubation, IV fluids and medication administration, cardiac monitoring and defibrillation, scenario based learning and evaluation.

EMS 272 EMT-Paramedic Skills Laboratory Part II  
(3)  
Continues the learning and practice of skills acquired in EMT-Paramedic Skills Lab, Part 1 with the addition of new skills learned in obstetrics, pediatrics, and medical emergencies. Includes invasive skills lab sessions, and scenario based learning and evaluation.  
Prerequisite: EMS 271.

EMS 281 Clinical Practicum I  
(6)  
Part I of a two-part clinical experience correlating knowledge and skills presented in lectures and labs. Supervised experience provided in emergency departments, respiratory therapy, psychosocial, poison control, EMS communications, anesthesia, surgical rounds, medical/cardiac critical care units, pediatrics and labor and delivery.  
Prerequisite: EMS 281.

EMS 282 Clinical Practicum II  
(12)  
Continuation of a two-part clinical experience correlating knowledge and skills presented in lectures and labs. Supervised experience provided in emergency departments, respiratory therapy, psychosocial, poison control, EMS communications, anesthesia, surgical and medical critical care units, pediatrics and labor and delivery.  
Prerequisites: EMS 281 and MATH 252.

EMS 290 Field Externship Practicum  
(18)  
Field experience with an affiliated advanced life support transporting agency. Students work under the direct supervision of a paramedic field-training officer.  
Prerequisites: MATH 251, PHY 202/222.

(ENGR) Engineering

ENGR 207 Seminar  
(Hours to be arranged each term.)

ENGR 211 Statics  
(4-0-4)  
Fundamental principles of mechanics of rigid bodies and the application of these principles to engineering problems.  
Pre- or corequisite: MATH 252.

ENGR 212 Dynamics  
(3-0-3)  
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, MATH 252.

ENGR 213 Strength of Materials  
(3-3-4)  
Internal stresses and deformations of structural members and machines when subjected to external forces.  
Prerequisite: ENGR 211.

ENGR 231 Fluid Mechanics  
(3-3-4)  
Fundamental properties of fluids, fluid statics, fluids in motion, dimensional analysis and similitude, flow in conduits, and flow measuring devices. Emphasis on practical applications of fluid mechanics principles.  
Prerequisites: ENGR 211 and MATH 252.

ENGR 236 Fundamentals of Electric Circuits  
(3-0-3)  
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 251, PHY 202/222.

ENGR 266 Computer Programming for Engineers  
(2-3-3)  
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 111.
ENGR 355 Thermodynamics  
(3-0-3)  
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; PHY 202 or PHY 222.

ENGR 407 Seminar  
(Hours to be arranged each term.)

ENGR 485 Fundamentals of Engineering Exam  
(1-0-1)  
Students are required to take the Fundamentals of Engineering Exam offered by the Oregon State Board of Examiners for Engineering and Land Surveying, or other state board with prior approval of program director. Prerequisite: Graduating Senior.

**Course Descriptions**

**ENGT 101 Engineering Technology Techniques**

(2-6-4)  
Engineering terminology and problem solving tools including computer aided drafting, technical sketching, word processing, spreadsheets, multiview projections, significant figures, and engineering problem solving techniques. Prerequisite: MATH 100.

**ENGT 103 Engineering Terminology**

(3-2-4)  
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 Electrical and Electronic Nomenclature and Symbols**

(3-0-3)  
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, ENGT 207, ENGT 307, ENGT 407 Seminar**  
(Hours to be arranged each term.)

**ENGR 230 Statics**

(3-0-3)  
Fundamental principles of mechanics of rigid bodies and the application of these principles to engineering problems. Corequisite: MATH 112.

**ENGR 231 Strength of Materials**

(3-0-3)  
Internal stresses, deflections, and deformations of structural members and machines when subjected to external forces. Prerequisite: ENGT 230 or ENGR 211.

**ENGR 232 Advanced Strength of Materials**

(2-3-3)  
Internal stresses, deflections, and deformations of structural members and machines when subjected to external forces. Column buckling, 3-D stress states, and failure criteria. Prerequisite: ENGT 231.

**ENGR 310 Introduction to Geothermal Energy**

(3-0-3)  
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.

**ENGR 311 Passive Solar and Solar Cell Design**

(3-0-3)  
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.

**ENGR 312 Critical Path Techniques**

(1-3-2)  
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.

**ENGR 370 Introduction to Automation and Robotics**

(2-3-3)  
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 laboratories. Prerequisites: MATH 112, a programming course.

**ENGR 390, 490 Co-op Field Practice**  
(Variable Credit)  
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.

**ENGR 391, 491 Co-op Field Practice**  
(Variable Credit)  
An approved work program related to the student’s field of specialization for a continuous three-month period.

**ENGR 415 Occupational Safety**

(2-3-3)  
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 370 Microprocessor Application in Automation and Robotics**

(2-3-3)  
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 500 Research Methods**

(3-0-3)  
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
(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
(3-3-4)
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
(3-3-4)
Prerequisite: VLSI or ASIC coursework or experience.

ENGT 522 ASIC Design II
(3-3-4)
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
(3-3-4)
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 function design, simulation and physical layout.
Prerequisite: ENGT 522.

ENGT 545 Advanced Microcomputers
(3-3-4)
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 Advanced Computer Architectures
(3-3-4)
Advanced topics in computer architectures including design of computer hardware, organizational structures, and architectural properties of parallel, vector and multiprocessor 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 547 Semiconductor Device Physics and Processes
(3-0-3)
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 565 Advanced Computer Architectures
(3-3-4)
Students prepare the proposal for the Master’s project under the guidance of a project adviser. Project proposal guidelines and accepted format presented. Approval of the proposal by the student’s project committee constitutes completion of the course.
Prerequisite: ENGT 581.

ENGT 582 Master’s Project II
(1-9-4)
Students complete task specified by the project adviser. 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
(1-9-4)
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.

(ENG) English

ENG 104, ENG 105, ENG 106 Introduction to Literature
(3-0-3)  H
Literature and the nature of literary experience through reading of prose and poetry drawn from American and other literatures. Works representing principal literary types are read in their entirety when possible, with emphasis on such elements as structure, style, characterization, imagery, and symbolism.

ENG 107, ENG 207, ENG 307, ENG 407 Seminar
(Hours to be arranged each term.)  H

ENG 211 Twentieth Century Novel: Nobel Prize Winners
(3-0-3)  H
A critical analysis of the Twentieth Century novel represented by a selection of world Nobel Prize winners.

ENG 212 Twentieth Century Drama
(3-0-3)  H
Critical examination of world drama from the beginning of the Twentieth Century to the present.

ENG 235 American Multicultural Literature
(3-0-3)  H
An introductory study of short stories, poetry, essays, and a novel that illustrates the diversity of North American culture.

ENG 246 Reading for Fiction Writers
(3-0-3)  H
Examines the elements, structures and traditions of fiction writing through readings, discussions, and creative writing exercises. For students interested in writing fiction.
Prerequisite: WRT 122.

ENG 253 American Literature I
(3-0-3)  H
A study of the romantic movement in American literature, 1800-1860, including the works of Irving, Emerson, Melville, Thoreau, Poe, Hawthorne, and Whitman.
ENG 254 American Literature II  
(3-0-3)  
A study of the realistic movement in American literature, 1860-1916, including the works of Dickinson, Howells, James, Cather, Crane, and Twain.

ENG 255 American Literature III  
(3-0-3)  
A study of the major writers and movements in American literature from World War I to the present, including the works of Hughes, Faulkner, Steinbeck, Plath, Silko, Barthelmie, and Carver.

ENG 266 Native American Literature and Film  
(3-0-3)  
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.

ENG 367 Art and Trash in Contemporary Fiction  
(3-0-3)  
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.

ENG 373 British Culture and Literature: Romanticism to the Present  
(3-0-3)  
Explores features of culture and selected works and writers from the Nineteenth and Twentieth Centuries in Britain. Some film presentation included.

ENG 381 Contemporary World Literature  
(3-0-3)  
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.

ENG 387 Children’s Literature for Teachers  
(3-0-3)  
Intensive study of children’s literature, including curriculum development for teaching children’s literature, and a review of current research and literature in the field of reading instruction. The course emphasizes selection and evaluation of books. Prerequisite: Teacher Education candidates, junior level or above only.

ENG 456 Topics in Film  
(3-0-3)  
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.

(ENV) Environmental Sciences  
ENV 107, ENV 207, ENV 307, ENV 407 Seminar  
(Hours to be arranged each term.) Prerequisite: ENV major or instructor consent.

ENV 112 Environmental Social Sciences  
(2-0-2)  
An introduction to the integration of science, social systems, environmental policy, and sustainability focusing on types of data, sampling techniques, and statistical methods used by social scientists. Emphasis on active learning and case study approaches. Prerequisites: BIO 111, BIO 112, ECO 201N, MATH 111 or instructor consent.

ENV 318 Systems Modeling  
(2-3-3)  

ENV 325 Environmental Microbiology  
(2-6-4)  
Microbial processes with emphasis on soil and water habitats. The impact of microorganisms in health, water and food sanitation, waste disposal, and bioremediation. Microscopy, laboratory, and field techniques for the isolation and identification of microorganisms. Prerequisites: BIO 213, CHE 223.

ENV 336 Environmental Hydrology  
(3-3-4)  

ENV 343 Field Methods and Data Collection  
(1-6-3)  
General principles of experimental design, site selection, and sensor selection. Use of instrumentation and data acquisition techniques from a choice of: solar monitoring and meteorological field stations, water quality, or soil monitoring locations. Prerequisite: CHE 342. Corequisite: PHY 203/PHY 223.

ENV 435 Atmospheric Physics  
(3-3-4)  
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. Prerequisites: MATH 252, PHY 202 or PHY 222.

ENV 466 Integrated Watershed Analysis  
(3-3-4)  

(GEOG) Geography  
GEOG 105 Physical Geography: Geomorphology  
(3-0-3)  
Landforms and geomorphological processes, including tectonics, erosion and weathering and biological influences. Satisfies Science elective.

GEOG 106 Cultural Geography I  
(3-0-3)  
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  
(3-0-3)  SS  
Cultural geography of the world’s underdeveloped realms—the countries of Middle and South America, Africa and Asia. The course emphasizes the regional approach.

GEOG 108 Cultural Geography III  
(3-0-3)  SS  
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 115 Physical Geography: Climatology  
(3-3-4)  
Weather and climate: atmospheric pressure, wind, moisture, global climate patterns, glacial processes and the hydrophere. Analysis of weather data, satellite tracking of storms and construction of climatographs. Satisfies lab science.

GEOG 207, 307, 407 Seminar  
(Hours to be arranged each term.)  SS

(GIS) Geographic Information Science

GIS 103 Introduction to GIS  
(0-3-1)  
Introduction to concept, basic vocabulary, and use of GIS and databases. Projections and coordinate systems. Modeling real world features using vector, raster, and linear networks. Comparison of CAD, coverage, and geodatabase models. A series of self-paced tutorials on CD.

GIS 105 Map and Compass/GPS  
(0-3-1)  

GIS 107, GIS 207, GIS 307, GIS 407 Seminar  
(Hours to be arranged each term.)

GIS 205 GIS Data Integration  
(1-3-2)  

GIS 306 Geospatial Raster Analysis  
(3-3-4)  

GIS 316 Geospatial Vector Analysis I  
(3-3-4)  

GIS 332 Customizing the GIS Environment I  
(3-3-4)  
Use of VBA/OOP to modify GIS GUI environment. Introduction to programming with ArcObjects and the use/creation of forms for managing data input/display. Navigation of ArcGIS UML diagrams for the creation of customized functionality. Prerequisite: GIS 134 and MIS 115.

GIS 426 Geospatial Vector Analysis II  
(3-3-4)  
Advanced techniques for geospatial analysis. Use and creation of dynamic segmentation and geometric networks for geospatial analysis. Advanced topological relationships. Use and creation of subtypes, domains, relationship classes and validation rules. Professional map creation skills. Prerequisite: GIS 316.

GIS 432 Customizing the GIS Environment II  
(3-3-4)  
Advanced use of ArcObjects to create custom GIS applications. Use of CASE tools. Students will apply skills towards the solution of various geospatial mapping scenarios. Prerequisite: GIS 332.

GIS 446 GIS Database Development  
(3-3-4)  
Advanced geodatabase design. Study, use and creation of data models. Extensive use and creation of subtypes, domains, relationship classes and validation rules. Students will apply skills towards the solution of various geospatial mapping scenarios. Prerequisites: GIS 426 and MIS 275.

GIS 456 GIS Management  
(3-0-3)  
Discussion of how to implement a GIS of any scope. Role of information products in implementation process. Creation of a data design. Selection of appropriate data model. Hardware, software and personal requirements. Prerequisites: GIS 426 and GIS 446.

GIS 468 GIS Practicum  
(Hours to be arranged each term.)

(GME) Geomatics

GME 107, GME 207, GME 307, GME 407 Seminar  
(Hours to be arranged each term.)

GME 134 Geographic Information Systems  
(2-6-4)  
Use of vector data, editing and querying of spatial and attribute data. Relating spatial and attribute data. Introduction to elements of map design. Shapefile-KML and CAD-GIS data conversion. Use of raster data, analyzing raster surfaces. Introduction to map algebra. Extensive use of ArcGIS™ software. Prerequisite: CIV 112 or GIS 103.

GME 161 Plane Surveying I  
(3-3-4)  
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  
(3-6-5)  
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, MATH 112.
GME 163 Route Surveying  
(2-9-5)  
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, GME 175, both with grade “C” or better.

GME 175 Computations and Platting  
(2-6-4)  
Introduction to coordinate geometry concepts and software used in professional practice. Data analysis and adjustment using least squares. Preparation of maps and plats using CAD. Prerequisites: CIV 112 and GME 161.

GME 241 Boundary Law I  
(3-0-3)  
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. Prerequisite: GME 161,WRI 121 or instructor consent.

GME 242 Land Descriptions and Cadastre  
(2-3-3)  
Real property descriptions and land record systems. Emphasis on interpreting and writing land descriptions, research in land records and multipurpose cadastre. Prerequisites: GME 161, GME 241, both with grade “C” or better.

GME 264 Digital Design for Surveying  
(1-6-3)  
Use of Carlson software to solve and plot assignments covering traverse calculations, horizontal and vertical curve alignments, profiles and earthwork volumes. Hand calculations will be made to supplement the computer solutions. Prerequisites: CIV 112, GME 163 with grade “C” or better.

GME 297 Seminar  
(Hours to be arranged each term.)

GME 299 Independent Studies  
(Hour to be arranged each term.)

GME 324 Geomatics Computer Programming  
(1-6-3)  
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, MIS 115.

GME 343 Boundary Surveys  
(2-6-4)  
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, GME 242, both with grade “C” or better.

GME 351 Construction and Engineering Surveying  
(2-6-4)  
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, GME 264.

GME 372 Subdivision Planning and Platting  
(2-6-4)  
Land use planning; governmental regulations as applied to subdivisions; subdivision planning, computations and preparation of subdivision plats. Prerequisites: GME 242, GME 264, both with grade “C” or better.

GME 395, GME 495 Cooperative Field Experience  
(0-40-4)  
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, GME 496 Cooperative Field Practice  
(0-40-2)  
Three month, two credit hour version of GME 395 and GME 495.

GME 415 Advanced Road Design  
(2-6-4)  
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: CIV 451 or GME 351.

GME 425 Remote Sensing  
(3-3-4)  
Overview of remote sensing and photogrammetry; geometry of vertical aerial and satellite images including parallax and stereopairs. Analytical photogrammetry collinearity and coplanarity equations and orientation matrices. Students use Leica Photogrammetry Suite software to orient an image strip, create a DEM and orthorectify an image. Prerequisites: MATH 252, PHY 222.

GME 434 Advanced Geographic Information Systems  
(2-6-4)  

GME 444 Adjustment by Least Squares  
(3-3-4)  
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 254N, MATH 361.

GME 451 Geodesy  
(4-0-4)  
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. Prerequisites: MATH 254N.
Courses with the following notation fulfill the appropriate general education requirements:  C – Communication    H – Humanities   SS – Social Science.
For more information see page 45.

GME 452 Map Projections
(3-0-3)
Overview of map projections used in cartography, with emphasis on conformal map projections used in the geomatics professions. Emphasis on state plane coordinate systems and local map projections. Prerequisite: GME 451 with grade "C" or better.

GME 454 GNSS Surveying
(2-6-4)
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, GME 451, both with grade "C" or better.

GME 457 Geomatics Practicum
(1-9-4)
Students participate in projects which integrate spatial positioning (GPS, geodesy, adjustments), boundary law, and L/GIS applications. Student teams perform research, establish and adjust a control network, perform field mapping. Students prepare final reports and L/GIS products. Prerequisites: GME 444, GME 452, GME 454, and GME 466.

GME 497 Seminar
(Hours to be arranged each term.)

GME 498 Workshop
(Hours to be arranged each term.)

GME 499 Independent Study
(Hours to be arranged each term.)

(HED) Health Education

HED 107, HED 207, HED 307, HED 407 Seminar
(Hours to be arranged each term.)

HED 240 Emergency Care and CPR
(2-0-2)
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 Drugs and Alcohol Problems of Modern Society
(2-0-2)
Physiological and psychological effects of drugs, from caffeine to heroin. A brief study of neuropathology 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 Contemporary Health Issues
(2-0-2)
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 and Exercise for Lifetime Fitness
(2-0-2)
Practical concepts of nutrition and exercise, their role in disease risk, obesity, and weight control. Consumer concerns, advertising, fads, gimmicks. Fitness and dietary evaluations.

(HIST) History

HIST 101, 102, 103 History of Western Civilization
(3-0-3) SS
Development of Western civilization from early beginning to the 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, HIST 207, HIST 307, HIST 407 Seminar
(Hours to be arranged each term.) SS

HIST 201, 202, 203 U.S. History
(3-0-3) SS
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 215 The American Western Experience
(3-0-3) SS
History of 19th century western America. Native American relations and the influence of the fur trappers, trail blazers, the railroad, the cattle industry and certain religious and ethnic groups on western development.

HIST 216 American Military History
(3-0-3) SS
Evolution of the conduct of war in the 20th century as a reflection of social, political, and technological developments. Course employs a case study approach focusing on a particular war of the 20th century. Wars studied may include World War I, World War II, and the Vietnam War.

HIST 224 Technology and the Ancient World
(3-0-3) SS
The interaction of technology and world civilization from earliest times to 1500 A.D. Topics include the development of agriculture, Greek and Roman engineering, and the technological roots of the Age of Discovery.
HIST 225 The Industrial Revolution
(3-0-3) SS
The economic and social roots of the Industrial Revolution, the technologies and scientific advances associated with it, and its impact on world civilization during the period 1500-1875.

HIST 226 Technology and the Modern World
(3-0-3) SS
The interaction of technological change and world civilization from 1875 to the present. Topics include the rise of industrial research, the origins and economic impact of mass production, and technological competition within the global economy.

HIST 256 Natural/Cultural History of Northwestern Nevada
(3-0-3)
A field course focusing on the early human habitation, geology and pioneer history of the Black Rock Desert and its environs in northwestern Nevada, with an emphasis on the Applegate Emigrant trail to Oregon.

HIST 266 Natural/Cultural History of Eastern Oregon
(3-0-3)
A field course focusing on the volcanic geology of Eastern Oregon, early ranch and sheep industries and an emphasis on early Native American Settlement.

HIST 335 The Engineering Profession
(3-0-3) SS
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
(3-0-3) SS
Study of the 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 1970s, glut of the 1980s; the modern energy paradigm. Prerequisite: WRI 123 or WRI 227.

HIST 392 Modern Asia
(3-0-3) SS
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.

(HSC) Health Sciences
HSC 207 Seminar
(Hours to be arranged each term.)
Prerequisite: Health Sciences major or instructor consent.

HSC 407 Seminar
(Hours to be arranged each term.)

HSC 485 Research and Project Proposal
(3-0-3)
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. Prerequisite: MATH 361, Health Sciences major or instructor consent.

(HUM) Humanities
HUM 107, HUM 207, HUM 307, HUM 407 Seminar
(Hours to be arranged each term.) H

HUM 125 Introduction to Technology, Society and Values
(3-0-3) H
An introduction to the relationship of economic, political, and social contexts to technological development with a focus on human values.

HUM 147 Introduction to Humanities I
(3-0-3) H
Study of the ideas and values from the classical period which have profoundly influenced Western culture. Readings and discussion will focus on literature, philosophy, the arts, and religion.

HUM 148 Introduction to Humanities II
(3-0-3) H
Study of the ideas and values from the Medieval to the Renaissance period which have profoundly influenced Western culture. Readings and discussion will focus on literature, philosophy, the arts, and religion.

HUM 149 Introduction to Humanities III
(3-0-3) H
Study of the ideas and values from the Age of Enlightenment to the modern period which have profoundly influenced Western culture. Readings and discussion will focus on literature, philosophy, the arts, and religion.

HUM 225 Contemporary Theater: Ashland Plays
(3-0-3) H
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. Course may be repeated for credit.

HUM 366 Engineering, Business and the Holocaust
(3-0-3) H
Examines three questions: what happened during the Holocaust, who was responsible, and what happened to those responsible. Topics include Nazi philosophy, anti-Semitic legislation, the camp system, German engineering and American business involvement, and aftermath. Prerequisite: WRI 122.

(IMGT) Industrial Management
IMGT 310 Principles of Production/Operations Management
(2-3-3)
The functions of planning, organizing, directing and controlling as applied in the areas of production and operations. Guest speakers and faculty will explore the problems and opportunities in Production/Operations Management. Company cases and facility visits will provide the student with first-hand knowledge of contemporary P/OM issues. Prerequisite: BUS 215.

IMGT 312 Operations Scheduling and Control I
(2-3-3)
Materials management, materials requirements planning, forecasting, inventory management, quality control, and critical path management. Prerequisites: MGT 321, MIS 375.
IMGT 313 Operations Scheduling and Control II
(2-3-3)
Advanced applications in scheduling and master scheduling, including Just-In-Time techniques, production planning and short-term forecasting systems, and independent demand inventory management. Distribution Requirement Planning (DRP) and Manufacturing Requirement Planning (MRP II) will be covered in detail. Prerequisite: IMGT 312.

IMGT 336 Total Quality Management
(3-0-3)
Investigation of the importance and impact of Total Quality Management on successful organizations. Exploration of TQM techniques as applied to quality planning, control, and improvement. Analysis of the relationship between quality and revenue. Prerequisite: Junior standing.

IMGT 391, 392 Co-op Field Practice
(0-9-3)
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 Business Division prior to employment. Prerequisite: Two terms of residence.

IMGT 405 Reading and Conference
(Hours to be arranged each term.)

IMGT 408 Workshop
(Hours to be arranged each term.)

IMGT 441 Operational Decision Models I
(2-3-3)
Application of quantitative methods for decision support under deterministic conditions. Emphasis on Linear Programming with sensitivity analysis. Prerequisites: MATH 361, MATH 371, MIS 375.

IMGT 442 Operational Decision Models II
(2-3-3)
Application of quantitative methods for decision support under conditions of uncertainty. Emphasis on discrete event simulation with sensitivity analysis. Prerequisite: IMGT 441 with grade "C" or better.

IMGT 455 Cost Engineering and Estimating
(3-0-3)
Evaluation of the factors of labor, material, and overhead in product costing and pricing. Implications of incremental volume in the cost estimating process. The role of process selection and improvement as a competitive tool. Prerequisite: MGT 345.

IMGT 481 Quality Control Techniques
(2-3-3)
Industrial quality assurance process control methods. Statistical benchmarking, standards setting, sampling methodology, mil-spec applications, control charts and automated tracing systems for high volume manufacturing applications. Prerequisites: IMGT 312, IMGT 336.

IMGT 482 Quality Management
(3-0-3)
The industrial quality management process. Contemporary approaches to quality control organizational structures and policy. Human factors, objective setting through quality circles and team management. Prerequisite: IMGT 481 or senior status in Manufacturing Engineering Technology.

IMGT 483 Cases in Quality Management
(3-0-3)
Review of complex quality problems and issues faced by actual firms in the service, manufacturing, and operations sectors. Intensive analysis using the case study method to explore the relationship of quality management with other management goals. Prerequisites: IMGT 482.

IMGT 488 Multinational Operations
(3-0-3)
Examination of current business issues involving international trade with emphasis on the Pacific Rim. Trade Growth interlink. Study of cultural differences, transportation considerations, financial and legal entry requirements. Prerequisite: BUS 434 or MGT 321.

(JOUR) Journalism

JOUR 107, JOUR 207, JOUR 307, JOUR 407 Seminar
(Hours to be arranged each term.)

JOUR 211 Publications—Student Newspaper
(F.W.S)(2-3-3)
Practical experience and training in the elementary principles of newspaper writing, makeup, and layout. Members of this class will publish the student newspaper.

JOUR 224 News and Editorial Functions
(2-3-3)
Recommended for pre-journalism majors; open to non-majors. Survey and criticism of communication media; discussion of journalistic techniques.

JOUR 225 Introduction to Advertising
(2-3-3)
An overview of the principles, historical, and contemporary practice of advertising in society with emphasis on newspapers, broadcast and other media organizations; ethics and career opportunities.

JOUR 226 Production Methods
(2-3-3)
Recommended for pre-journalism majors; open to non-majors. Survey and criticism of communication media; discussion of journalistic techniques.

JOUR 311 Advanced Publications—Student Newspaper
(F.W.S)(1-3-3)
Advanced experience and training in principles of newspaper editing, reporting, writing, makeup, layout, and specialty areas. Members of this class will serve in the advanced areas of the newspaper staff. Prerequisite: Instructor consent.

Courses with the following notation fulfill the appropriate general education requirements: C - Communication  H - Humanities  SS - Social Science.
For more information see page 45.
For more information see page 45.

Courses with the following notation fulfill the appropriate general education requirements:

- **C** – Communication
- **H** – Humanities
- **SS** – Social Science

For more information see page 45.
MIS 126 C++ Programming II
(3-3-4)
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
(3-3-4)
Introduces number systems, Boolean algebra, digital logic, computer arithmetic, instruction sets, memory, system software, and network organization and architecture. Laboratory exercises on digital logic, computer architecture, machine language and assembly language programming. Completion of a programming project. Corequisite: MATH 100.

MIS 136 Object-Oriented Programming with C++
(3-3-4)
A study of object oriented programming with C++. Beginning and intermediate concepts are covered including classes, objects, member functions, overloaded operators, 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 CST 136.
Prerequisite: MIS 126, with grade “C” or better.

MIS 215 Business Application Programming
(3-3-4)
Object-oriented and/or procedural languages employed with an emphasis on structured design, user interface design and error processing. Advanced language elements and program structures.
Prerequisites: MATH 111 and MIS 115, or one term of programming and instructor consent.

MIS 217 Health Care Systems and Policy
(3-0-3)
This course will explore the U.S. Health System focusing on its historical development, current configuration and possible future direction. Included will be the study of health system development, key influencers, accessibility, financing, changing components and the effects the system has on patients, providers, financiers, 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.

MIS 225 Business on the Internet
(3-3-4)
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.
Prerequisite: MIS 275 or instructor consent.

MIS 255 Health Informatics Concepts and Practices
(3-0-3)
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 on 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 256 Hardware/Software Integration
(3-3-4)
An overview of personal computer technology: comparing components such as display, CPU, memory units and peripherals. Setting standards for selecting, maintaining and supporting automated business information systems. Relationship of systems and applications software to available system software, hardware and selected peripherals. In-depth software comparison, user rating, security and error recovery techniques.
Prerequisite: MIS 311 with grade “C” or better; or instructor consent.

MIS 272 Introduction to Networking
(3-3-4)
Network concepts including topologies, fundamentals of network communications, components of Ethernet networks. Introduction to LANs and WANs, OSI model; components of simple networks.
Prerequisite: MIS 256 with grade “C” or better.

MIS 275 Introduction to Relational Databases
(2-3-3)
The relational model, DBMS functions, administration, design methodology, normalization, QBE and SQL. Hands-on design, development and use of a database system using the Microsoft Access software including queries, updates, reports, forms, macros and application systems.

MIS 311 Introduction to Information Systems
(3-0-3)
Prerequisite: MIS 275.

MIS 312 Systems Analysis I
(4-0-4)
Planning and Analysis phases of Systems Development Life Cycle. Focus 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.
Prerequisite: MIS 311 with grade “C” or better.

MIS 315 Computer Software Techniques
(3-0-3)
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.

Courses with the following notation fulfill the appropriate general education requirements: C – Communication  H – Humanities  SS – Social Science.

For more information see page 45.
MIS 322 Systems Analysis II  
(3-3-4)  
Prerequisite: MIS 312.

MIS 341 Relational Database Design I  
(3-3-4)  
Design, install, create and maintain an Oracle database. Provides conceptual understanding of 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: CST 311 or MIS 275.

MIS 342 Relational Database Design II  
(3-3-4)  
Construct graphical end-user interfaces for scalable, high-performance Internet applications. Covers building, testing, debugging and deploying interactive Internet applications that use Oracle database software as a back-end. Uses Oracle Forms, modules, stored procedures and database triggers to implementing business rules. 
Prerequisite: MIS 341.

MIS 343 Relational Database Design III  
(2-3-3)  
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 345 Health Care Information Systems Management  
(3-0-3)  
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 317 and MIS 217.

MIS 351 Enterprise Network Design I  
(3-3-4)  
High-level design of primary network architectures employed in modern business networks. Design logical and physical models to create the network documentation required for modern information systems. Focus on the management, performance, scalability and reliability of the central data centers. 
Prerequisites: MIS 272, WRI 227. 
Pre- or corequisite: MIS 312.

MIS 352 Enterprise Network Design II  
(3-3-4)  
Focus on management responsibilities inherent in enterprise networks. Includes project labs using network infrastructure to implement design goals and team projects. 
Prerequisite: MIS 351.

MIS 353 Information and Communication Systems in Health Care  
(2-3-3)  
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 and systems such as PACS, lab and pharmacy systems and computerized provider order entry (CPOE). 
Prerequisite: MIS 255.

MIS 375 Decision Support Systems  
(2-3-3)  
Use of personal computer application programs for analysis and reporting, problem solving and decision assistance. 
Prerequisites: MIS 102, MIS 311 with grade "C" or better, MATH 361 and MATH 371.

MIS 390, 490 Co-op Field Experience  
(Hours to be arranged each term.)  
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 adviser 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  
(Hours to be arranged each term.)

MIS 408 Workshop  
(Hours to be arranged each term.)

MIS 414 Information Systems Development  
(2-3-3)  
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 445 Legal, Ethical and Social Issues in Health Care Technology  
(3-0-3)  
Legal, ethical, and social issues in health care, especially as they impact systems design, development, use, and management will be examined. 
Prerequisites: MIS 217 and MIS 345.

MIS 479 Current Topics in Information Technology  
(3-0-3)  
Advanced topics focusing on special interests and newly developed technology in IT. Concentration on a current subject such as client/server architecture, networking, telecommunications, database technology, programming, the Internet, ethics, security and privacy of information. 
Prerequisite: MIS 375 or instructor consent.

MIS 496 Senior Project Management  
(3-3-4)  
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: At least one programming class with grade “C” or better, all junior-level courses, BUS 356, MIS 312.

MIS 497 Senior Project II  
(1-6-3)  
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
(1-6-3)
Senior 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.

(MFG) Manufacturing Engineering Technology

MFG 101 Introduction to Manufacturing
(2-3-3)
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 Introductory Welding Processes
(2-3-3)
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.

MFG 107, MFG 207, MFG 307, MFG 407 Seminar
(Hours to be arranged each term.)

MFG 112 Introduction to Manufacturing Processes
(3-0-3)

MFG 120 Manufacturing Processes I
(2-6-4)
An introductory course in metal removal processes emphasizing drilling, milling, and lathe processes. Includes tool bit grinding. Emphasis on production speeds and feeds.
Prerequisites: MATH 100, MET 111.

MFG 204 Data Management
(2-0-2)
Current topics in data acquisition and management.

MFG 220 Manufacturing Processes II
(2-3-3)
Advanced concepts in material removal. Turning, milling, shaping, and drilling. Cutting tools and cutting requirements.
Prerequisites: MET 160, MET 241, MFG 120.

MFG 223 Casting and Molding Processes
(3-3-4)
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, MET 160.

MFG 245 Electronics Manufacturing
(3-0-3)
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, microbonding, and component packaging.
Prerequisites: CHE 101, MET 112.

MFG 275 CAD for Manufacturing
(2-3-3)
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
(Hours to be arranged each term.)

MFG 298 Reading and Conference
(Hours to be arranged each term.)

MFG 299 Laboratory Practice
(Hours to be arranged each term.)

MFG 314 Geometric Dimensioning and Tolerancing
(2-3-3)
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, MET 241.

MFG 315 Geometric Dimensioning and Tolerancing Laboratory
(0-3-1)
Laboratory exercises using parts that have geometric drawing requirements.
Corequisite: MFG 314.

MFG 316 Metrology
(1-3-2)
Measurements by mechanical, electronic, and optical methods related to industrial dimensional conformance requirements. Drawing and part compliance methods, including geometric dimensioning verification techniques.
Prerequisites: ACC 333 or IMGT 310 or MFG 275 or MFG 314.

MFG 317 Machine Element Design
(3-0-3)
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 ENGT 231 and MFG 275 or MFG 314.

MFG 325 Principles of Metrology, Machining and Welding
(3-3-4)
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
(3-0-3)
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  
(2-3-3)  
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: MET 326.

MFG 333 Statistical Methods for Quality Improvement  
(3-0-3)  

MFG 334 Manufacturing Group Project  
(1-6-3)  
Development of a product by a group of manufacturing students working together. This includes creating or modifying the design of the 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 Programming  
(2-3-3)  
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, MFG 120, MET 241.

MFG 342 Computer Aided Machining  
(2-3-3)  
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: MFG 341, MET 375.

MFG 343 Manufacturing Tool Design  
(3-0-3)  

MFG 344 Design of Manufacturing Tooling  
(2-3-3)  
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. Prerequisites: MET 241, MFG 343.

MFG 351, MFG 352, MFG 353 Microelectronics Manufacturing Processes I, II, III  
(3-0-3)  
A three term 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: For MFG 351–CHE 101, PHY 202. Prerequisite: For MFG 352–MFG 351. Prerequisite: For MFG 353–MFG 352.

MFG 404 Co-op Field Practice  
(Term 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.

MFG 405 Reading and Conference  
(Hours to be arranged each term.)

MFG 408 Workshop  
(Hours to be arranged each term.)

MFG 415 Finishing Methods  
(2-0-2)  
Review of material finishing technologies with focus on functional requirements of final product, life-cycle environmental considerations, and manufacturing technologies for material finishing. Prerequisite: MET 160.

MFG 420 Manufacturing Processes III  
(3-0-3)  
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; and MFG 220 or MFG 325; and PHY 201/PHY 221.

MFG 425 Plastic Manufacturing Processes  
(2-3-3)  
Fundamentals of polymer science and plastic manufacturing methods. Introduction to the affect of chemistry and morphology of plastics on material selection, product design, and process design. Emphasis is on thermoplastic processes such as injection molding. Prerequisites: MET 160 and MFG 375, or instructor consent.

MFG 428 Manufacturing Engineering Certification  
(1-0-1)  
Students are required to take the Certified Manufacturing Engineer Exam or Certified Manufacturing Technician Exam offered by the Society of Manufacturing Engineers. Prerequisite: Graduating senior.

MFG 444 Assembly and Testing Methods  
(2-3-3)  
Manufacturing tooling design methods and technologies involved in product assembly and testing. Focus is on product analysis to specify design cost-effective, high-quality, high-yield assembly and test methods and equipment. Prerequisites: MFG 314, MFG 333; or ACC 333 or IMGT 310.

MFG 445 Plant Layout and Handling Systems  
(3-0-3)  
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, MFG 313.
MFG 447 Lean Manufacturing  
(3-0-3)  
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. Prerequisites: MFG 313 and MFG 333.

MFG 453 Automation and Robotics in Manufacturing  
(2-3-3)  
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 permission of instructor.

MFG 454 Thermal Systems for Manufacturing  
(3-0-3)  
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 455 Computer Integrated Manufacturing  
(3-0-3)  
Philosophy of manufacturing encompassing activities necessary to transform purchased materials into product, to deliver product to the customer, and to support the performance of the product in the field. Presentation of current concepts of manufacturing and integration of information through the use of computers. Prerequisites: ACC 335 or IMGT 310 or MFG 313.

MFG 456 Materials Science  
(3-0-3)  
Study of the relationship of a material’s structure to its properties. Materials studied include nonferrous metals, polymers, ceramics, composites, and electronics materials. Prerequisite: MFG 420.

MFG 461 Senior Project I  
(1-6-3)  
The first term of the three-term comprehensive capstone manufacturing project. This term concentrates on the development and presentation of a formal project proposal, followed by early stages of project development. Prerequisites: MFG 331, MFG 342, MFG 313; or instructor consent. Corequisite: WRI 321.

MFG 462 Senior Project II  
(0-9-3)  
The second term of a three-term project. This term concentrates on material acquisition and process development. Prerequisite: MFG 461.

MFG 463 Senior Project III  
(0-9-3)  
The final term of a three-term project. Process refinement and production of the product agreed to during the proposal phase. Requires formal reporting and presentation. Prerequisite: MFG 462.

MFG 465 Advanced Welding Methods  
(3-0-3)  
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: MET 160, MFG 103.

MFG 503 Thesis  
(Variable credit 1-16)  
Course may be repeated for credit.

MFG 507 Seminar  
(1-0-1)  
Course may be repeated for credit.

MFG 521 The Manufacturing Management Team in the Global Enterprise  
(3-0-3)  
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 Manufacturing Business Philosophies  
(3-0-3)  
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 Principles for Manufacturing  
(3-0-3)  
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 Project and Budget Planning for Manufacturing  
(3-0-3)  
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 for Manufacturing  
(3-0-3)  
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. Prerequisites: ECO 201N and ECO 202N or equivalent (See instructor).
MFG 531 Engineering Mechanics
(3-0-3)

MFG 533 Thermal Processes and Technology in Manufacturing
(3-0-3)

MFG 534 Design Technology for Manufacturability
(3-0-3)
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
(3-0-3)
Use of high-end enterprise-wide software products for integrating design, automating the workflow, and comprehensively controlling security. Revision management over all types of data. Creating document links. Leveraging subject matter experts across the extended enterprise.

MFG 536 Automated Technology for Tool Path Generation
(3-0-3)
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 Product Data Management and Configuration Control
(3-0-3)
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 Manufacturing Software
(3-0-3)
Independent study using advanced functionality in high-end manufacturing and enterprise software. Approval of faculty adviser required.

MFG 562 Advanced Materials Science and Technology
(3-0-3)
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 Control and Production Planning
(3-0-3)
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 and Philosophies
(3-0-3)

MFG 596 Selected Topics in Engineering Science and Design Technology
(3-0-3)
Manufacturing related topics in engineering science and design. Course may be repeated for credit.

MFG 597 Selected Topics in Manufacturing Software and Computer Integration
(3-0-3)
Manufacturing related topics in software and computer integration. Course may be repeated for credit.

MFG 598 Selected Topics in Advanced Manufacturing Materials and Processes Technology
(3-0-3)
Manufacturing related topics in materials and processing technology. Course may be repeated for credit.

MFG 599 Selected Topics in Business, Financial and Management Processes
(3-0-3)
Manufacturing related topics in business and management. Course may be repeated for credit.

(Math) Mathematics

Note: Unless otherwise indicated with F, W, S courses will be offered as often as requested.

MATH 20 Basic Mathematics
(3-0-3)
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.

MATH 70 Elementary Algebra
(FWS)(4-0-4)
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.

Prerequisite: MATH 20 with grade “C” or better, or equivalent.
MATH 97 Algebra Review
(1-0-1)
Structured review for students whose Math Placement score may not reflect an accurate evaluation of their algebra background. This is strictly a Distance Education course with individualized directed study using a comprehensive programmed instructional technology. Course is only offered in summer term following each ROAD registration.
Students receive a conditional waiver of Math Placement score and are allowed to register in a higher level math course for fall term. Course is also appropriate for those students who merely want a refresher but do not require a placement waiver. Course will not serve as a replacement for any existing OIT math course, nor will it substitute as a prerequisite for a math course. Course is graded P/W.

MATH 100 Intermediate Algebra
(F,W,S)(4-0-4)
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
(70, 100, 111)(4-0-4)
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
(F, W, S)(4-0-4)
A variety of modern mathematical topics based on contemporary applications. Topics include combinatorics, probability, statistics, finance, matrices, and logarithmic and exponential functions.
Prerequisite: Intermediate Algebra with grade “C” or better.

MATH 107, MATH 207, MATH 307, MATH 407 Seminar
(Hours to be arranged each term.)

MATH 111 College Algebra
(F,W,S)(4-0-4)
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, MATH 111B College Algebra
(111A FW; 111B WS)(1-2-2)
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: For MATH 111A–Math 100 with grade “C” or better, or equivalent.
Prerequisite: For MATH 111B–Math 111A with grade “C” or better.

MATH 112 Trigonometry
(F,W,S)(4-0-4)
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 212 Fundamentals of Elementary Mathematics II
(W)(4-0-4)
This is the second course in the mathematics sequence for prospective elementary 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 213 Fundamentals of Elementary Mathematics III
(S)(4-0-4)
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 Introduction to Computational Software
(2-0-2)
Solve applied problems involving formulas, functions, summation and iteration using Excel and MATLAB. Use built-in functions and graphing capabilities of MATLAB and Excel. Do vector and matrix calculations and write function files using MATLAB. Write and execute macros in Excel.
Prerequisite: MATH 112.

MATH 243 Introductory Statistics
(4-0-4)
Descriptive statistics, numerical and graphical presentation of data, estimation and margin of error, hypothesis testing, correlation; interpretation of statistical results. Cannot be taken for graduation credit by students who have taken MATH 361.
Prerequisite: MATH 100 or instructor’s consent.

MATH 251 Differential Calculus
(F,W,S)(4-0-4)
Theory, computational techniques and applications of the derivative.
Prerequisite: MATH 112 with grade “C” or better, or equivalent.

MATH 252 Integral Calculus
(F,W,S)(4-0-4)
Computational techniques for and applications of the definite and indefinite integrals.
Prerequisite: MATH 251 with grade “C” or better.

MATH 253N Sequences and Series
(2-0-2)
Indeterminate forms and improper integrals. Infinite sequences and series, convergence, power series. Taylor series and applications. This course replaces MATH 254.
Prerequisite: MATH 252 with grade “C” or better.

Courses with the following notation fulfill the appropriate general education requirements:  C – Communication  H – Humanities  SS – Social Science.
For more information see page 45.
MATH 254N Vector Calculus I  
(F.W,S)(4-0-4)
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. Prerequisite: MATH 252 with grade “C” or better.

MATH 261 Introduction to Linear Algebra  
(3-0-3)
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. Prerequisite/Corequisite: MATH 251 or instructor consent.

MATH 311 Introduction to Real Analysis  
(4-0-3)
A one term stand-alone course on topics in real analysis, covering properties of real numbers, completeness axiom, continuity, convergence of sequences and series of numbers, convergence of sequences and series of functions. Emphasis will be placed on proofs. Prerequisites: MATH 253N and MATH 327, both with grade “C” or better.

MATH 321 Applied Differential Equations I  
(F.W,S)(3-0-3)
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 Applied Differential Equations II  
(4-0-4)
The second in a two term sequence on the solutions of ordinary differential equations. Introduction to systems of equations, the Laplace transform and series solutions. Prerequisite: MATH 321 and MATH 341.

MATH 327 Discrete Mathematics  
(F,S)(4-0-4)
Introduction to proof and mathematical abstraction. Topics include sets, set operations, functions, relations, sequences, series, recurrence relations, mathematical induction, equivalence relations. Prerequisite: MATH 252, or junior standing and MATH 111, both with grade “C” or better.

MATH 341 Linear Algebra I  
(3-0-3)
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.

MATH 342 Linear Algebra II  
(3-0-3)
A continuation of the topics of MATH 341 to the setting of abstract vector spaces. Includes the study of orthogonality, inner product spaces, eigenvalues and eigenvectors, matrix decompositions and a more advanced study of linear transformations. Prerequisite: MATH 341.

MATH 346 Number Theory  
(3-0-3)
A proof-based course in the theory of the 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 Fundamentals of Abstract Algebra  
(4-0-4)
Introduction to group theory and algebraic structures with applications. Prerequisites: MATH 254N, MATH 327, both with grade “C” or better.

MATH 348 Numerical Analysis  
(3-0-3)
Introduction to numerical methods, numerical integration, interpolation, solution of nonlinear equations, eigenvalues and eigenvectors of matrices. Prerequisites: MATH 254N, MATH 327.

MATH 354 Vector Calculus II  
(4-0-4)
Review of vector functions, space curves, gradients, and directional derivatives. Introduction to vector analysis: vector fields, divergence, curl, line integrals, surface integrals, conservative fields, and the theorems of Gauss, Green and Stokes with applications to force, work, mass, and charge. Prerequisite: MATH 254N with grade “C” or better.

MATH 361 MATH 362 Statistical Methods I, II  
(361-F,W,S)(4-0-4); (362-S)(4-0-4)
Graphical representation of statistical data, measures of central tendency and variability, and elementary probability. Applications of binomial, normal, “t”, “F”, and chi-square distributions; tests of hypothesis; regression and correlation analysis. Multiple regression, analysis of variance and design and analysis of experiments. Prerequisite: For MATH 361–MATH 111 or instructor’s consent. Prerequisite: For MATH 362–MATH 361 or MATH 465 with grade “C” or better.

MATH 371, MATH 372 Finite Mathematics and Calculus I, II  
(4-0-4)
Linear functions, matrices, linear programming, mathematics of finance, derivatives and their applications. The integral and its applications, and calculus of several variables. Prerequisite: For MATH 371–MATH 111 with grade “C” or better. Prerequisite: For MATH 372–MATH 371 with grade “C” or better.

MATH 421 Applied Partial Differential Equations I  
(4-0-4)

MATH 422 Applied Partial Differential Equations II  
(4-0-4)
The second course in a three term sequence in applied partial differential equations. Introduction to solution techniques using eigenvalues and eigenfunctions. Presentation of eigenfunctions which form orthogonal bases such as Bessel functions and Legendre polynomials. Prerequisite: MATH 421.

MATH 423 Applied Partial Differential Equations III  
(4-0-4)
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.

Courses with the following notation fulfill the appropriate general education requirements:  C – Communication  H – Humanities  SS – Social Science.
For more information see page 45.
MATH 425 Vector Analysis
(3-0-3)
Operations on vectors including dot product, cross product, curl and differentiation; tangent and normal vectors; divergence with applications.
Prerequisite: MATH 254N.

MATH 451 Numerical Methods I
(4-0-4)
Computer applications of matrix methods, iterative solutions of equations, and systems of equations, polynomial interpolation and curve fitting, numerical differentiation and integration.
Prerequisite: MATH 252 and a programming language.

MATH 452 Numerical Methods II
(4-0-4)
Prerequisites: MATH 451 and MATH 321

MATH 453 Numerical Methods III
(4-0-4)
Prerequisites: MATH 421 and MATH 452.

MATH 465 Mathematical Statistics
(2-3-3)
Counting techniques, probability, discrete and continuous random variables and distribution functions, joint probability distributions; expected value, variance and covariance; decision making.
Prerequisite: MATH 254N.

(MECH) Mechanical Engineering

MECH 107, MECH 207, MECH 307, MECH 407 Seminar
(Hours to be arranged each term.)

MECH 160 Materials I
(2-3-3)
Survey of materials used in industry and their physical and chemical principles as they relate to structure, properties, corrosion, and engineering applications. Major consideration given to metal alloys. Introduction to polymers, ceramics and composites included.
Prerequisite: CHE 221 or equivalent.

MECH 304, MECH 404 Co-op Field Practice
(Terms and hours to be arranged with approval of the curriculum coordinator.)

MECH 312 Dynamics II
(3-0-3)
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, MATH 321.

MECH 313 Thermodynamics II
(3-0-3)
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
(3-0-3)
Study of stress and fatigue analysis as applied to machine elements.
Prerequisite: ENGR 213.

MECH 316 Machine Design II
(3-0-3)
Application of stress and fatigue analysis in the design and selection of machine elements.
Prerequisite: MECH 315.

MECH 323 Heat Transfer I
(3-0-3)
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: MATH 321, MECH 318.

MECH 326 Electric Power Systems
(2-3-3)
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
(2-3-3)
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.
Prerequisites: MET 375, MECH 315.

MECH 360 Materials II
(3-0-3)
This course extends the MET 160 Materials I class using a more theoretical approach. Subjects include metals, polymers, ceramics, and composites.
Prerequisites: MET 160 and CHE 201 or CHE 221.

MECH 363 Instrumentation
(2-3-3)
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.
Prerequisites: MATH 361 or MATH 465, PHY 222.
Pre- or corequisite: ENGR 236.
MECH 375 Solid Modeling
(2-3-3)
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 405 Reading and Conference
(Hours to be arranged each term.)

MECH 414 Introduction to Aerodynamics
(3-0-3)
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, MECH 318.

MECH 415 Design Project
(2-3-3)
This course involves using material from prior course work in individual student projects. Prerequisites: MECH 315, MECH 318, MET 242. Pre- or corequisite: MECH 316.

MECH 417 Fluid Mechanics II
(2-3-3)
Fluid Kinematics, differential analysis, similitude and modeling, and compressible flow. Computational fluid dynamics is introduced. Prerequisites: ENGR 355, MATH 321, MECH 318.

MECH 421 Introduction to Wind Tunnels
(2-3-3)
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, MECH 363.

MECH 427 Experiments in Thermodynamics
(2-3-3)
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, MECH 363.

MECH 433 HVAC
(2-3-3)
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. Prerequisite: MECH 323.

MECH 436 Applied Control Systems
(2-3-3)
An introduction to control systems. Both classic control theory and programmable logic controllers are considered. Topics include block diagrams, mathematical models, transfer functions, LaPlace transforms, frequency responses along with control components and PLC programming. Prerequisites: EE 223 or MECH 363, ENGR 212, ENGR 266, MATH 321, MECH 318.

MECH 437 Heat Transfer II
(1-3-2)
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. Prerequisites: MECH 323, MECH 363.

MECH 438 Reciprocating and Turbine Engines
(3-0-3)
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, MECH 318.

MECH 475 Parametric Modeling
(2-3-3)
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.

MECH 480 Vibrations
(2-3-3)
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, MATH 321, MECH 315, MECH 363.

MECH 490 Senior Projects I
(2-3-3)
The first of a three-term comprehensive group design project, focusing on the design proposal. This sequence applies material from prior course work, along with concepts of project management, design optimization, and other material related to a group engineering project. Prerequisites: ENGR 355, MECH 315, MECH 318, MET 375, or instructor consent. Corequisite: WRI 321.

MECH 491 Senior Projects II
(2-3-3)
The second of a three-term comprehensive group design project, focusing on project design. The third of a three-term comprehensive group design project, focusing on project construction and testing. Prerequisites: MECH 490, previous term from same instructor, or adviser and instructor consent. Corequisite: WRI 322.

MECH 492 Senior Projects III
(1-6-3)
The third of a three-term comprehensive group design project, focusing on project construction and testing. Prerequisites: MECH 491, previous term from same instructor, or adviser and instructor consent. Corequisite: WRI 323.

(MET) Mechanical Engineering Technology

MET 107, MET 207, MET 307, MET 407 Seminar
(Hours to be arranged each term.)

MET 108 Geometric Dimensioning and Tolerancing
(2-0-2)
The study and application of ANSI geometric dimensioning and tolerancing principles relative to the preparation of engineering drawings. Prerequisite: MET 241.
MET 111 Orientation I  
(1-3-2)  
Introduction to modern tools of engineering, Creativity in the design of systems and components; on both design and presentation teams. Identification, analysis and solutions to engineering problems. Effective communication techniques. Technical sketching and isometric drawing skills.

MET 112 Orientation II  
(1-3-2)  
Continuation of MET 111. This sequence will introduce the students to economic, environmental, social, political, ethical, health and safety realities of the campus and the engineering work place; as well as club, networking and internship opportunities. 
Prerequisite: MET 111.

MET 160 Materials I  
(2-3-3)  
Survey of materials used in industry and their physical and chemical principles as they relate to structure, properties, corrosion, and engineering applications. Major consideration given to metal alloys. Introduction to polymers, ceramics and composites included. 
Prerequisites: CHE 101/CHE 104 or CHE 201/CHE 204 or CHE 221.

MET 218 Fluid Mechanics  
(3-3-4)  
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, PHY 201, or PHY 221.

MET 232 Thermodynamics  
(3-0-3)  
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; PHY 202 or PHY 222.

MET 241 CAD for Mechanical Design I  
(1-3-2)  
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: MET 112.

MET 242 CAD for Mechanical Design II  
(1-3-2)  
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  
(Hours to be arranged each term.)

MET 299 Laboratory Practice  
(Hours to be arranged each term.)

MET 304, 404 MET Co-op Field Practice  
(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.

MET 313 Applied Thermodynamics  
(3-0-3)  
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 or MET 232.

MET 315 Machine Design I  
(3-0-3)  
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 ENGT 232; MET 160; PHY 201 or PHY 221.

MET 316 Machine Design II  
(3-0-3)  
A study of power transmission systems 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  
(3-0-3)  
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 or MET 232; MET 218.

MET 326 Electric Power Systems  
(2-3-3)  
Study related to theory and application of industrial electric power systems. Topics covered include transformers, motors, generators, motor controls, and protective devices. 
Prerequisites: ENGR 236.

MET 351 Finite Element Analysis  
(2-3-3)  
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 Materials II  
(3-0-3)  
This course extends the MET 160 Materials I class using a more theoretical approach. Subjects include metals, polymers, ceramics, and composites. 
Prerequisite: MET 160.

MET 363 Instrumentation  
(2-3-3)  
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: PHY 202 or PHY 222. 
Pre- or corequisite: ENGR 236.

MET 375 Solid Modeling  
(2-3-3)  
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 405 Reading and Conference  
(Hours to be arranged each term.)
MET 414 Applied Aerodynamics  
(3-0-3) 
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; MET 218. 

MET 415 Design Project  
(2-3-3) 
This course involves using material from prior coursework in individual student projects. 
Prerequisites: MET 218, MET 315. 
Pre- or corequisite: MET 316. 

MET 416 Energy Systems  
(3-0-3) 
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 326. 

MET 417 Gas Laws  
(2-3-3) 
Application of thermodynamics and fluid mechanics to the analysis of flow of both ideal and real gases in pipes, nozzles, diffusers, compressors and turbines. The course also emphasizes the use of appropriate instrumentation. 
Prerequisites: MET 218, MET 313, MET 363. 

MET 421 Wind Tunnel Technology  
(2-3-3) 
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, MET 363. 

MET 426 Fluid Power Systems  
(2-3-3) 
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. 
Prerequisites: MET 218, MET 363. 

MET 427 Experiments in Thermodynamics  
(2-3-3) 
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, MET 363. 

MET 433 HVAC  
(2-3-3) 
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, MET 323. 

MET 436 Control Systems  
(3-0-3) 
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, MET 363. 

MET 437 Heat Transfer II  
(1-3-2) 
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. 
Prerequisites: MET 323, MET 363. 

MET 438 Reciprocating and Turbine Engines  
(3-0-3) 
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, MET 315. 

MET 462 Vacuum Technology  
(2-3-3) 
An introductory course defining the role of high and ultra-high vacua 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 Computational Strength of Materials  
(3-0-3) 
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: ENGT 230 and ENGT 231; or ENGR 211 and ENGR 213; MET 351 and MATH 252. 

MET 475 Parametric Modeling  
(2-3-3) 
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 242. 

MET 480 Vibrations  
(2-3-3) 
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, MET 315. 

MET 490 Senior Projects I  
(2-3-3) 
The first of a three-term comprehensive group design project, focusing on the design proposal. This sequence applies material from prior coursework, along with concepts of project management, design optimization, and other material related to a group engineering project. 
Prerequisites: ENGR 355 or MET 232; MET 218, MET 315 and MET 375; or instructor consent. 
Corequisite: WRI 321.
MET 491 Senior Projects II  
(2-3-3)  
The second of a three-term comprehensive group design project, focusing on project design.  
Prerequisite: MET 490 previous term from same instructor, or adviser and instructor consent.  
Corequisite: WRI 322.

MET 492 Senior Projects III  
(1-6-3)  
The third of a three-term comprehensive group design project, focusing on project construction and testing.  
Prerequisite: MET 491 previous term from same instructor, or adviser and instructor consent.  
Corequisite: WRI 323.

(MIT) Medical Imaging Technology

MIT 103 Introduction to Medical Imaging  
(3-0-3)  
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, MIT 207, MIT 307, MIT 407 Seminar  
(Hours to be arranged each term.)

MIT 333 HIPAA for PACS/Hi

(3-0-3)  
Basic concepts of HIPAA, including consideration of how HIPAA affects patient information systems. Covers the three parts of HIPAA law, and the role of IT professionals who interact with patient data.  
Prerequisite: MIT 103 or instructor permission.

MIT 361 Introduction to PACS

(3-0-3)  
This is a survey of PACS based systems and technologies making up enterprise PACS. Topics include: number systems and data representation, computer architecture, database management systems, computer networks, health informatics workflow, DICOM and HL7.

MIT 362 PACS Networking

(3-0-3)  
Study of principles and fundamentals of network based communication between PACS, Imaging Modalities and network related devices. The 7 layer communication model is studied as mapped to standard TCP/IP implementations. Layer 7 is approached in relevance to the DICOM standard packet definitions and DICOM information model.  
Prerequisite: MIT 361 with grade “C” or better.

MIT 363 PACS DBMS

(3-0-3)  
Study of principles and fundamental concepts characterizing data representation relevant to PACS systems. Topics covered include database basics, SQL, Normalization Techniques, DICOM information definitions, Project definitions are based on DICOM Standard as an information model.  
Prerequisite: MIS 275, MIT 362 with grade “C” or better.

MIT 374 Quality Assurance of Medical Images

(3-0-3)  
An overview of the medical imaging modalities, focusing on image identification and acquisition, relative to basic quality control procedures and guidelines for a quality assurance program.  
Prerequisites: BIO 233, BIO 200 with grade “C” or better.

(MSC) Military Science

MSC 111 Adventure Training I

(1-0-1)  
Examination and practical application of survival skills, camping, rope bridging, and basic first aid. Optional field trips offered.

MSC 112 Role of the Army

(1-0-1)  
Study of the total Army, its concept and role in society. Examines missions, organization, personnel, and history of the Active Components of the Army and the Army National Guard and Reserve.

MSC 113 Adventure Training II

(1-0-1)  
Examination and practical application of basic rifle marksmanship, rappelling, and mountain climbing. Optional field trips offered.

MSC 211 Land Navigation

(2-0-2)  
Basic topographic map reading skills and land navigation using a lensatic compass and terrain association. Includes practical exercises.

MSC 212 Leadership and Management

(2-0-2)  
Introduction to fundamental leadership and management, including problem analysis, decision-making, planning, management control, and interpersonal skills.

MSC 213 Basic Military Skills

(2-0-2)  
Basic military skills in first aid; radio and wire communications; nuclear, biological, and chemical (NBC) defense; and weapons employment and operation. Note: mandatory for OCS enrollment.

MSC 214 Basic Camp

(0-6-2)  
Intensive two-week precommissioning training. Oriented on leader development and individual/small unit training in a physically and mentally rigorous environment. Individual proficiency in land navigation and communication skills is evaluated. Practical experience in a variety of leadership positions is provided.

MSC 311 Military Leadership

(3-0-3)  
Study of Army Command and Control and small unit leadership fundamentals. The junior officer’s role and responsibilities in the leadership process are examined. Topics such as professional ethics, soldier/team development, and Army written and oral communication skills are addressed.  
Prerequisite: MSC 214.

MSC 313 Small Unit Tactics

(3-0-3)  
Study of the fundamentals, techniques, and procedures of light infantry squad and platoon tactics. Develops leader skills in planning, organizing, and conducting small unit operations.  
Prerequisite: MSC 214.

MSC 314 Advanced Camp

(0-6-2)  
Intensive two-week precommissioning training oriented on squad and platoon tactical training in a field environment. Students plan, organize, and conduct small unit operations and train in a variety of leadership positions. Located at Ft. Lewis, Washington.  
Prerequisites: MSC 214, MSC 311, and MSC 313.

Courses with the following notation fulfill the appropriate general education requirements:  
C – Communication  
H – Humanities  
SS – Social Science.  
For more information see page 45.
**MSC 315 Military Justice System**
(3-0-3)
Examines military justice, from non-judicial punishment to the military court-martial. Introduces many practical exercises to prepare junior officers for their role in the military justice system.

**MSC 411 Army Training Management**
(3-0-3)
Study of the Army's training philosophy and the Army Training System. Focuses on the junior officer's role and responsibilities in the process of battle focus planning, establishing unit training programs, and executing military instruction. Prerequisite: MSC 314.

**MSC 412 Military Law and Administration**
(3-0-3)
Study of military justice, army personnel management, and army logistics and supply. Focus is on the junior officer's role and responsibilities in military law enforcement, officer and enlisted personnel management, resource management, and service support. Prerequisite: MSC 314.

**MSC 413 Personal Affairs and Career Development**
(3-0-3)
An in-depth examination of the Second Lieutenant's role in the total Army and preparation for officer commissioning in the Army National Guard. Provides critical information on topics from officer specialty selection, unit assignment, pay and benefits, training status and attendance, call-ups and mobilization, to career planning, professional development, balancing personal/family life, civilian employment, and military service. Designed for a successful transition into civil-military life. Prerequisite: MSC 314.

**(MUS) Music**

**MUS 195 Band**
(0-3-1)  
(One hour each term.)

**MUS 197 Chorus**
(0-3-1)  
(One hour each term.)

**(NMT) Nuclear Medicine Technology**

**NMT 107, NMT 207, NMT 307, NMT 407 Seminar**
(Hours to be arranged each term.)

**NMT 205 Nuclear Medicine Administration**
(2-0-2)
Orientation 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. Prerequisite: MIT 103 with grade “C” or better.

**NMT 212 Nuclear Medicine Physics/ Radiation Biophysics**
(3-0-3)
Interactions of radiation with matter. Introduction to the design and function of radionuclide generators, labeling procedures, stability and pyrogenicity considerations, radionuclide and radiochemical quality control procedures. Prerequisite: CHE 210, NMT 205, both with grade “C” or better.

**NMT 215 Radiochemistry and Radiopharmacy**
(3-0-3)
The design and function of radionuclide generators, labeling procedures, stability and pyrogenicity considerations, radionuclide and radiochemical quality control procedures. Prerequisite: CHE 210, NMT 205, both with grade “C” or better.

**NMT 217 Patient Care**
(3-3-4)
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 Physics/ Instrumentation**
(3-0-3)
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**
(3-0-3)
Introduction to Cardiovascular Imaging 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, NMT 217.

**NMT 311 Imaging Procedures I**
(3-3-4)
Proper patient care before, during and after the procedure, identification and administration of prescribed radiopharmaceuticals. 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**
(3-3-4)
Proper patient care before, during and after the procedure, identification and administration of prescribed radiopharmaceuticals. The use of imaging devices and external detectors for body organ imaging. Prerequisite: NMT 225 with grade “C” or better.

**NMT 313 Therapeutic Procedures and In-Vitro Studies**
(3-3-4)
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. Body composition tests using In-Vitro techniques. Prerequisite: NMT 312 with grade “C” or better.

**NMT 325 SPECT Imaging and Computer Applications**
(3-3-4)
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. Prerequisite: BIO 335 and NMT 312 with grade “C” or better.

Courses with the following notation fulfill the appropriate general education requirements:  
C – Communication  
H – Humanities  
SS – Social Science.

For more information see page 45.
NMT 346 Magnetic Resonance (3–3–4)
Physics and principles used in the production of magnetic resonance images and spectroscopy. Static magnetic fields, gradient magnetic fields, secondary coil fields, nuclear magnetic resonance (NMR), spatial domain, frequency domain, computer data acquisition, relaxation times, pulse sequence diagrams. Laboratory simulation is included.
Prerequisites: NMT 225 and PHY 217 (or equivalent) with grade “C” or better.

NMT 355 Computed Tomography (3–3–4)
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: NMT 367, BIO 335.

NMT 367 PET Imaging (3–0–3)
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 311.
Corequisites: BIO 335, NMT 355.

NMT 388 Externship Preparation (2–0–2)
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.
Prerequisites: NMT 365, BIO 335.
Corequisites: NMT 313, NMT 325.

NMT 410 Nuclear Medicine Technology Externship (0–40–15)
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.

(NRS) Nursing

NRS 110/NRS 210 Foundations of Nursing—Health Promotion (9)
This course introduces the learner to framework of the OCNE curriculum. The emphasis on health promotion across the life span includes learning about self-health as well as client health practices. To support self and client health practices, students learn to access research evidence about healthy lifestyle patterns and risk factors for disease/illness, apply growth and development theory, interview clients in a culturally-sensitive manner, work as members of a multidisciplinary team giving and receiving feedback about performance, and use reflective thinking about their practice as nursing students. The family experiencing a normal pregnancy is a major exemplar. Includes classroom and clinical learning experiences.
Prerequisite: Anatomy and Physiology.

NRS 111/NRS 211 Foundations of Nursing In Chronic Illness I (6)
This course introduces the learner to assessment and common interventions (including technical procedures) for clients with chronic illnesses common across the life span in major ethnic groups within Oregon. The client and family’s “lived experience” of the illness, coupled with clinical practice guidelines and extant research evidence is used to guide clinical judgments in care to the chronically ill. Roles of multidisciplinary team in care of the chronically ill, and legal aspects of delegations are explored. Through case scenarios, cultural, ethical, health policy, and health care delivery system issues are explored in the context of the chronic illness care. Case exemplars include children with asthma, adolescent with a mood disorder, Type II diabetes, and older adults with dementia. Includes classroom and clinical learning experiences.
Prerequisite: NRS 110, NRS 211: concurrent with NRS 230 and NRS 232).

NRS 221/NRS 321 Foundations of Nursing In Chronic Illness II and End-of-Life (9)
This course builds on Foundations of Nursing in Chronic Illness I. The evidence base related to family care giving and symptom management is a major focus and basis for nursing interventions with patients and families. Ethical issues related to advocacy, self-determination, and autonomy are explored. Complex skills associated with symptom management, negotiating in interdisciplinary teams, and the impact of individual and family development cultural beliefs are included in the context of client and family centered care. Exemplars include patients with chronic mental illness and well as other chronic conditions and disabilities affecting functional status and family relationships. Includes classroom and clinical learning experiences. (Can follow Nursing in Acute Care II and End-of-Life).
Prerequisites: Completion of First year of Nursing Curriculum: NRS 110/NRS 210; NRS 111/NRS 211; NRS 112/NRS 212; Nurs 230, NRS 231, NRS 232, NRS 233.
Courses with the following notation fulfill the appropriate general education requirements:  

**C** – Communication  
**H** – Humanities  
**SS** – Social Science.

For more information see page 45.
NRS 411 Epidemiology
(3)
Explores the determinants of death, disease, disability, disorders and disillusionment in humankind. Introduces principles and methods of epidemiologic investigation. Examines how properly conducted studies contribute to understanding of etiologic factors, modes of transmission, and pathogenesis. Explores social and structural determinants of the five D's and their implications for policy and nursing practice.
Prerequisite or corequisite: Statistics.

NRS 412 Leadership and Outcomes Management in Nursing
(10)
This course provides the learner with the opportunity to consider nursing practice from the vantage point of middle managers and senior leaders in the profession in selected inpatient and community settings. Focus is on use of outcome data to evaluate nursing care delivery systems and propose quality improvement initiatives, considering enduring practice issues, policy debates and historical solutions. Students will understand how nursing influences client care, its own practice and the larger health care delivery system. Includes classroom and clinical learning experiences.
Prerequisites: NRS 110/NRS 210; NRS 111/NRS 211; NRS 112/NRS 212; NRS 230, NRS 231, NRS 232, NRS 233, NRS 222/NRS 322; NRS 221/NRS 321.

NRS 424 Clinical Immersion I
(6-10)
This course is designed to formalize the clinical judgments, knowledge and skills necessary for practice of nursing with a selected population. The experience focuses on complex clinical judgments, interdiscplinary team functioning and leadership, and the development of habits for lifelong learning. Faculty/preceptor/ student analysis and reflection throughout the experience provide the student with evaluative criteria against which they can judge their own experience. Students who have completed NRS 224 as part of the OCNE AAS Curriculum may enroll for 6 credits.
Prerequisites: NRS 110/NRS 210; NRS 111/NRS 211; NRS 112/NRS 212; NRS 230, NRS 231, NRS 232, NRS 233, NRS 222/NRS 322; NRS 221/NRS 321, NRS 410, NRS 411, NRS 412.

NRS 425 Clinical Immersion II
(10)
A continuation of NRS 424, this course provides the student with the opportunity for developing deeper understanding of and competence in the nursing care of the selected population. The course is designed to help the learner in the transition to the work world. Emphasis is on the health care needs of the selected population, and the associated systems and policy issues. Includes seminar and precepted clinical learning experiences.
Prerequisites: NRS 110/NRS 210; NRS 111/NRS 211; NRS 112/NRS 212; NUS 230, NRS 231, NRS 232, NRS 233, NRS 222/NRS 322; NRS 221/NRS 321, NRS 410, NRS 411, NRS 412, NRS 425.

(OST) Office Systems Technology

OST 170 Office Systems Management
(2-3-3)
Administrative office management concepts including telecommunications, handling of mail and use of postal systems, receptionist and general office functions, office supplies and equipment, financial responsibilities, handling meeting and travel arrangements, time management, composition, building human relations skills, career paths and job search techniques, and quality management.
Prerequisite: Minimum keyboarding skill of 35 wpm.

OST 207 Seminar
(Hours to be arranged each term.)

OST 237, OST 238 Coop Work Experience I and II
(1-6-3)
Approved work program related to the student's field of specialization. The employer and type of difficulty of the job must be approved by the department. A written report of work activities must be submitted by the end of the term employed. Prerequisites: OST 170 or instructor consent.

OST 295 Individual Studies
(Hours to be arranged each term.)

OST 298 Reading and Conference
(Hours to be arranged each term.)

OST 299 Laboratory Practice
(Hours to be arranged each term.)

(PHIL) Philosophy

PHIL 107, PHIL 207, PHIL 307, PHIL 407 Seminar
(Hours to be arranged each term.)

PHIL 331 Ethics in the Professions
(3-0-3)
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.

(PhED) Physical Education

PHED 107, PHED 307, PHED 407 Seminar
(Hours to be arranged each term.)

PHED 190 Physical Education
(0-3-1)
Service course. General participation in physical activities to promote sound health.

PHED 207 Major Sports Seminar
(1-2-2)
Development of professional competencies in fundamentals of training methods and objectives of major sports.

PHED 291 Lifeguard Training
(1-2-2)
Basic skills of lifesaving in aquatic programs; American Red Cross Advanced Lifesaving Authorization.

PHED 292 Water Safety Instructor
(1-2-2)
Analysis, methods of instruction, and teaching of aquatic skills; American Red Cross Authorization in Water Safety Instruction.

(PHY) Physics

PHY 107, PHY 207, PHY 307, PHY 407 Seminar
(Hours to be arranged each term.)

PHY 201 General Physics
(3-3-4)
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  
(3-3-4)  
Temperature systems, heat, kinetic theory of gases, 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  
(3-3-4)  
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 215 Topics in Astronomy  
(2-3-3)  
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 Medical Imaging  
(3-0-3)  
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 with Calculus  
(3-3-4)  
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 with Calculus  
(3-3-4)  
Temperature systems, heat, kinetic theory of gases, thermodynamics and the fundamentals of electricity and magnetism. All general physics students must register for a laboratory section.  
Prerequisites: PHY 221, MATH 252.

PHY 223 General Physics with Calculus  
(3-3-4)  
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.

PHY 237 Meteorology  
(2-3-3)  
Principles of atmospheric structure and movement; horizontal and vertical motions; air masses; micrometeorology; atmospheric diffusion in relation to air pollution.  
Prerequisite: PHY 202 or PHY 222.

PHY 311, PHY 312, PHY 313 Introduction to Modern Physics  
(3-0-3)  
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 and Magnetism  
(3-0-3)  
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.  
Prerequisite: MATH 254N, PHY 222.  
Corequisite: MATH 253N.

PHY 410 Mathematical Methods: Fourier Optics  
(3-0-3)  
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 254N.

PSCI 201 United States Government  
(3-0-3)  
Basic concepts and principles of American political system.

PSCI 250 Introduction to World Politics  
(3-0-3)  
SS  
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 326 World Politics in Transition  
(3-0-3)  
SS  
International relations theory and world politics in the post-Cold War period. Topics include changing great power relations, conflict management, global inequalities and transnational problems.  
Prerequisite: PSCI 250.

PSCI 355 International Conflict in the 20th Century  
(3-0-3)  
SS  
The functions, origins, and forms of war in the 20th Century examined in the context of political theory and history. Case studies include World War I, World War II, Korea, Vietnam, and the Persian Gulf War.  
Prerequisite: PSCI 250.

PSCI 497 United States Foreign Policy  
(3-0-3)  
SS  
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.

(PSG) Polysomnographic Technology  
PSG 107, PSG 207 Seminar  
(Hours to be arranged each term.)  

PSG 211 Fundamentals of PSG and Patient Care  
(3-0-3)  
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  
(3-0-3) 
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  
(4-0-4) 
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  
(3-0-3) 
In-depth study of sleep disorders in women exploring: the menstrual cycle; circadian rhythms and shiftworking 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 Polysomnography  
(4-0-4) 
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.

PSG 271A Clinical Polysomnographic Technology Part A  
(2-12-6) 
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 Polysomnographic Technology Part B  
(2-12-6) 
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 Polysomnographic Technology Part C  
(2-12-6) 
Advanced aspects of polysomnographic technology including recognition of sleep disorders, recording and monitoring, therapeutic interventions, scoring, MSCLT, RTSW and neurophysiology interpretation of sleep. Part-time students only, requires 18 daytime clinical hours weekly. Prerequisite: PSG 271B.

PSG 272 Clinical Polysomnographic Technology I  
(2-27-9) 
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 Polysomnographic Technology II  
(2-27-9) 
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.

(PSY) Psychology

PSY 107, PSY 207, PSY 307, PSY 407 Seminar  
(Hours to be arranged each term.) SS

PSY 110 Human Services Careers  
(1-0-1) SS

Presentation and discussion of career options of psychology majors.

PSY 201 Psychology  
(3-0-3) SS
Introduction to the principles and applications of psychology. Topics include scientific methodology, learning, memory and cognitive processes.

PSY 202 Psychology  
(3-0-3) SS
Introduction to the principles and applications of psychology. Topics include the brain and behavior, consciousness, sensation and perception, and health psychology.

PSY 203 Psychology  
(3-0-3) SS
Introduction to the principles and applications of psychology. Topics include social psychology, personality, maladjustment and psychotherapy.

PSY 215 Abnormal Psychology I  
(3-0-3) SS
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, impulsivity, alcohol and substance abuse disorders. Prerequisite: PSY 203 or instructor consent.

PSY 216 Abnormal Psychology II  
(3-0-3) SS
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 215 or instructor consent.

PSY 220 Community Psychology  
(3-0-3) SS
Community mental health, epidemiology, program evaluation and social ecology. Research, theory and practice in community settings. The influence of community-environmental factors in individual functioning and their utilization to promote mental health. Prerequisite: PSY 203.

PSY 301 Basic Counseling Techniques  
(3-3-4) SS
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-play formats. Prerequisite: DH 240 or PSY 216.
PSY 311 Human Growth and Development I
(3-0-3) SS
A biosocial study of human development from conception to adolescence. Discusses the biological and social processes (e.g., cognition, personality, emotion, and social) affecting the developing child. Applications to health care, family, and education are discussed.
Prerequisite: DH 240 or PSY 201.

PSY 312 Human Growth and Development II
(3-0-3) SS
The psychological study of the continuing development of the human being from adolescence through old age and death. Discussion focuses on the social and health care issues of adulthood. Applications to health care, family and social policy.
Prerequisite: PSY 201.

PSY 313 Psychological Research Methods I
(3-3-4) SS
Overview of the techniques of research in psychology. Emphasis placed on evaluating psychological measurements, reliability and validity, and interpretation of psychological data. Reviews sources of invalidity and techniques for minimizing these sources.
Prerequisites: PSY 203, MATH 243 or MATH 361, each with grade “C” or better.

PSY 314 Psychological Research Methods II
(3-3-4) SS
Overview of the techniques of research in psychology. Emphasis placed on techniques of quantitative research. Review of experimental, quasi-experimental, field and survey research methods.
Prerequisite: PSY 313.

PSY 317 Field Placement Seminar
(2-0-2) SS
Presentations and discussions of externship and laboratory sites, and skills sets involved in human service.

PSY 321, PSY 322 Theories of Personality
(3-0-3) SS
In-depth coverage of personality theories in terms of each theorist’s personal experiences and the theories’ major concepts and definitions of mental illness and treatment. Applications of various theoretical concepts to case studies and to people in their personal lives.
Prerequisite: PSY 201, PSY 202 or PSY 203.

PSY 325 Stress Management
(3-3-4) SS
Discussion of the concept of stress and its physical and psychological impact. Description of the physical and psychological stress reactions, stress related disease processes and techniques of stress management.
Prerequisite: PSY 215 or instructor consent.

PSY 330 Social Psychology I
(3-0-3) SS
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 203.

PSY 331 Social Psychology II
(3-0-3) SS
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 330.

PSY 334 Behavior Modification I
(3-3-4) SS
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.
Prerequisite: PSY 203.

PSY 335 Behavior Modification II
(3-3-4) SS
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.
Prerequisite: PSY 334.

PSY 336 Health Psychology I
(3-0-3) SS
The scientific study of behavior, thoughts, attitudes, and beliefs related to health and illness. Specific areas covered include: stress, realities of health care delivery, research methods, and patient demographics.

PSY 337 Health Psychology II
(3-0-3) SS
The scientific study of behavior, thoughts, attitudes, and beliefs related to health and illness. Specific areas covered include: substance abuse, alcohol problems, eating disorders, AIDS, coronary heart, pain, chronic illness, pediatric health, and health problems of aging.
Prerequisite: PSY 336.

PSY 339 Biopsychology
(3-0-3) SS
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: PSY 202 or BIO 232 or instructor consent.

PSY 341 Psychoactive Drugs I: Psychiatric Drugs
(3-0-3) SS
Physiological, behavioral, social, and societal effects of psychiatric drugs including anti-anxiety, anti-depressant, and anti-psychotic drugs.
Prerequisites: PSY 202 and PSY 216.

PSY 342 Psychoactive Drugs II: Abused Drugs
(3-0-3) SS
Physiological, behavioral, social, and societal effects of abused drugs including alcohol, hallucinogens, marijuana, opiates, and stimulants.
Prerequisite: PSY 341.

PSY 347 Organizational Behavior
(3-0-3) SS
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
(3-3-4) SS
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 352 Cognitive Restructuring II
(3-3-4) SS
Analysis of thought patterns which cause behaviors leading clients to mandated counseling. Laboratory component includes participation in client groups and casework.
Prerequisite: PSY 351.
PSY 355 Evolutionary Psychology  
(3-0-3) SS  
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 358 Psychology of Gender  
(3-0-3) SS  
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.

PSY 360 Organizational Psychology  
(3-0-3) SS  
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  
(3-0-3) SS  
Application of psychological principles, theories and behavioral techniques applied to human relations problems in industrial situations. Prerequisite: Junior standing or instructor consent.

PSY 364 Environmental Psychology  
(3-0-3) SS  
Analysis of the interaction between human behavior and the environment. Discussions focus on how the environment affects humans and how human behavior influences the environment. Topics include environmental stress, architecture, perceptions and attitudes, and behavior to save the environment. Prerequisite: PSY 201.

PSY 371 Human Sexuality I  
(3-0-3) SS  
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, PSY 202, or PSY 203.

PSY 372 Human Sexuality II  
(3-0-3) SS  
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 371 or concurrent enrollment in PSY 371.

PSY 374 Therapeutic Communities  
(3-6-5) SS  
The construction of therapeutic communities. Teaches students techniques for assisting clients to support each other's efforts at cognitive and/or behavior change. Discussion groups and on-site visits. Prerequisite: PSY 220.

PSY 401 Advanced Counseling Techniques  
(3-3-4) SS  
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 402 Applied Psychology Methods II  
(3-3-4) SS  
Skills training in paraprofessional counseling and assessment techniques, program development and evaluation. Interviewing, evaluation procedures, consultation, referral, seminar development and delivery are included. Individualized instruction and supervision of individual projects. Role-playing of helping skills is a major focus. Prerequisite: PSY 401.

PSY 403 Applied Psychology Methods III  
(2-6-4) SS  
Focus on application of skills and knowledge acquired in Methods I and II courses. Practicum-like experience of supervised implementation of projects created in PSY 402 (e.g., seminar delivery), or other participation in an established program, either on or off campus. Prerequisite: PSY 402.

PSY 410 Organizational Change and Development  
(3-0-3) SS  
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 Abnormal Behavior of Children and Adolescents  
(3-0-3) SS  
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, PSY 312.

PSY 420 Applied Psychology Internship  
(4, 8, 12 or 16 credit hours) SS  
Opportunities to work under supervision in applied settings related to student's emphasis. Students gain experience working with mandated clients, patients in health care settings, or businesses. Prerequisites: PSY 317 and permission of Extern Committee.

PSY 421 Senior Project I  
(1-6-3) SS  
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 314.

PSY 422 Senior Project II  
(1-6-3) SS  
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 Senior Project III  
(1-6-3) SS  
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 428 Animal Behavior**  
(3-0-3)  SS  
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: PSY 202 or BIO 213.

**PSY 431 Family Therapy**  
(3-0-3)  SS  
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**  
(3-3-4)  SS  
Theory and application of group therapy techniques. Historical and current applications of group treatment, special populations and multicultural considerations.  
Prerequisite: PSY 301.

**PSY 446 Psychological Trauma**  
(3-0-3)  SS  
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.  
Prerequisites: PSY 301.

**PSY 456 Performance Management**  
(3-0-3)  SS  
Applications of Applied Behavior Analysis in business, industry and government. Includes proposal to identify and intervene with real-life performance problem.  
Prerequisite: PSY 335.

**PSY 464 Organizational Structure**  
(3-0-3)  SS  
Analysis of how organizations divide work to employees and then coordinate across employees. Describes how organizational structure changes with changing conditions.  
Prerequisite: PSY 361.

**PSY 480 Theories of Learning**  
(4-0-4)  SS  
The basics of the major learning theories as they apply to operant and respondent conditioning, social learning, and memory.  
Prerequisite: PSY 335.

**PSY 497 Special Projects/Training**  
(Variable Credit 1-6)  SS  
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.  
Prerequisite: Senior standing in Applied Psychology and permission of HSS department chair.

**PSY 499 Independent Study**  
(Variable Credit 1-6)  SS  
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.  
Prerequisite: Senior standing in Applied Psychology and permission of HSS department chair.

**REE Renewable Energy Engineering**

**REE 107, REE 207, REE 307, REE 407 Seminar**  
(Hours to be arranged each term.)

**REE 201 Introduction to Renewable Energy**  
(3-0-3)  
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 243 Electrical Power**  
(3-3-4)  
Fundamentals of electrical power; maximum power transfer, single-phase circuits, three-phase circuits, wye-delta transformations, power factor, harmonics. Electrical power systems studied include: transmission lines, power transformers, autotransformers, three-phase transformers, resonance and power factor correction, building electrical systems, the national power grids.  
Prerequisites: EE 223; MATH 252 with grade “C” or better.

**REE 253 Electromechanical Energy Conversions**  
(2-3-3)  
AC machines, including single phase, split-phase and three-phase (induction and synchronous machines) motors and generators; introduction to power switching devices, speed control and brushless DC motors. DC machines including shunt, series and compound. Control devices and circuits, including ladder diagrams.  
Prerequisite: EE 223; MATH 252 with grade “C” or better.

**REE 331 Fuel Cells**  
(2-3-3)  
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 and PHY 222 with grade “C” or better.

**REE 339 Senior Project I**  
(1-3-2)  
Selection, definition, and analysis of a problem suitable for a renewable energy engineering senior project prior to actual project development. Includes consideration of project parameters, and implications, proposal of alternate solutions, and justification of selected solution. Culminates in the writing of project proposal.  
Prerequisite: WRI 327.

**REE 344 Nuclear Energy**  
(3-0-3)  
Prerequisites: CHE 222, PHY 223.

**REE 345 Wind Power**  
(3-0-3)  
Prerequisites: REE 253 or MECH 326. PHY 222.
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REE 346 Biofuels and Biomass
(2-3-3)
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, or CHE 222, PHY 222.

REE 347 Hydroelectric Power
(3-0-3)

REE 348 Solar Thermal Energy Systems
(3-0-3)
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. Prerequisites: REE 323, PHY 223.

REE 412 Photovoltaic Systems
(3-0-3)
The solar resource, sun charts, site assessments. Grid-connected and stand-alone systems. Module and array performance. PV system 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 343.

REE 413 Electric Power Conversions Systems
(3-0-3)

REE 439 Energy Systems Management and Auditing
(3-0-3)
Evaluating building thermal/electrical loads, including lighting, HVAC and central plant systems, industrial processes and hot water use. Opportunities for managing energy use through controls and operations/maintenance strategies. Roles of commissioning, energy auditing, renewables and economic analysis in reducing energy use. Prerequisite: MECH 433.

REE 449 Senior Project II
(0-6-2)
A continuation of REE 339. Prototype construction of project solution begins. Written documentation is produced including design calculations and functional analysis of hardware and/or software needed for project solution. Prerequisites: WRI 327, REE 339.

REE 451 Geothermal Energy and Ground-Source Heat Pumps
(3-0-3)
An introduction to geothermal energy resources. Discussion of heat flow mechanisms. Investigation into heat exchange systems including: binary, flash, double flash, total flow. Application of thermal dynamics in analysis, design and control of heating/cooling systems. Prerequisite: MECH 323.

REE 455 Energy-Efficient Building Design
(3-0-3)
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 433.

REE 459 Senior Project III
(0-6-2)
Completion of the project proposed in REE 339 and designed in REE 449. Documentation with specifications, functional description, calculations, test results, schematics, graphs, flowcharts, parts lists, diagrams and photographs become part of the project final report. The student defends their project before a review panel. Prerequisite: REE 449.

REE 463 Energy Systems Instrumentation and Control
(2-3-3)
Application of electrical and mechanical sensors, data acquisition and logic controllers as applied to energy systems. Determination of physical parameters necessary for control and data-logging. Methods of calibration and correction. Lab projects employ programmable logic controllers. Prerequisites: EE 321.

REE 465 Renewable Energy Transportation Systems
(3-0-3)
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: REE 253 or MECH 326. MECH 323.

(RCP) Respiratory Care Program

RCP 100 Introduction to Respiratory Care
(2-0-2)
A survey of the development of respiratory care including an introduction to quality and evidence-based respiratory care, patient safety, communication, recordkeeping, principles of infection control, medical ethics, physical principles and computer applications in respiratory care.

RCP 107, RCP 207, RCP 307, RCP 407 Seminar
(Hours to be arranged each term.)

RCP 120 Interventions in Gas Exchange
(4-0-4)
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 221 Introduction to Patient Assessment
(5-0-5)
Acquisition and interpretation of the patient history, physical examination, vital signs, laboratory data including arterial blood gases and chest radiograph. Collaborative activities include the acquisition, analysis and communication of findings. Prerequisite: Acceptance into Respiratory Care Program or instructor’s consent.
RCP 231 Pulmonary Physiology
(4-0-4)
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 231.

RCP 235 Arterial Blood Gases
(2-0-2)
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: RCP 231.

RCP 241 Respiratory Gas Therapeutics
(3-3-4)
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 Respiratory Care Program.

RCP 252 Cardiopulmonary Pharmacology
(4-0-4)
A study of the administration, pharmacokinetics, administration and actions of medications. Emphasis is placed on bronchodilators, steroids, mukolytics and antileukotriene agents. Vasodilative, antiarrhythmics, diuretics, sedatives, antimicrobials and neuromuscular blocking agents are introduced. Prerequisite: CHE 210.

RCP 261 Clinical I
(1-6-3)
Sequential courses designed to provide clinical competence essential to the practice of respiratory care. Competence developed in the area of basic patient assessment, oxygen therapy, aerosol therapy, medical charting and professional communication. Prerequisites: BIO 105, RCP 281.

RCP 262 Clinical II
(0-9-3)
Sequential courses designed to provide clinical competence essential to the practice of respiratory care. Competence developed in the area of basic patient assessment, ABGs, hyperinflation therapies, medical charting and professional communication. Prerequisites: BIO 105, RCP 281.

RCP 281 Professional Review
(3-0-3)
Systematic problem solving needed to pass the certified respiratory therapist credential. Passage of CRT Self Assessment Examination required for course completion. Prerequisites: RCP 252, RCP 261, RCP 336.

RCP 304 Field Studies
(5-0-5)
Study, investigation and application of various physiologic and respiratory care technologies in a variety of settings. Applied cardiopulmonary sciences in each field. Special topics. Prerequisite: RCP 281.

RCP 326 Disaster Preparedness
(1-0-1)
Preparation for unusual biological disasters. Case-based instruction on anthrax, SARS, influenza, bird flu, tuberculosis, emergency room hospital violence and unrest, evacuation and loss of services caused by hurricanes, floods and fire. Prerequisite: RCP 235.

RCP 335 Pulmonary Rehabilitation and Geriatrics
(4-0-4)
Introduction to the development of and participation in pulmonary rehabilitation teams for the restoration of individual capacity. Behavioral considerations associated with pulmonary disease, age and social support. Prerequisite: RCP 235.

RCP 336 Hyperinflation Therapies
(2-3-3)
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. Prerequisite: RCP 235.

RCP 337 Pulmonary Pathology
(4-0-4)
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 Diagnosis and Monitoring
(2-3-3)
Collaborative investigation, practice, 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
(1-6-3)
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 Act (HIPAA). Competence developed in the area of basic patient assessment, oxygen therapy, aerosol therapy, medical charting and professional communication. Prerequisite: RCP 337.

RCP 351 Mechanical Ventilation
(3-3-4)

RCP 352 Mechanical Ventilation II
(3-3-4)
Description and analysis of the adult patient-mechanical ventilator system including the initiation, assessment, management and discontinuation. Prerequisite: RCP 351.

RCP 361 Clinical III
(0-18-6)
Sequential courses designed for the development of clinical competence. Initial practice and observation in neonatal and pediatric cardiopulmonary care and adult mechanical ventilation. Prerequisite: RCP 304.

RCP 362 Clinical IV
(0-21-7)
Sequential courses designed for the development of clinical competence. Practice and observation of cardiovascular hemodynamics. Emerging competence in adult and pediatric intensive care. Prerequisite: RCP 361.
RCP 363 ICU Clinical
(0-36-12)
Sequential courses designed for the development of clinical competence. Management of airway care, pharmacology and mechanical ventilation in adult, pediatric and neonatal intensive care units. Demonstration of summative competence.
Prerequisite: RCP 362.

RCP 366 Clinical Simulation
(3-0-3)
The practice and measurement of critical thinking in the context of computer branching logic simulations. Students use organized sequential topical examinations to review and measure retention of respiratory care content. Passage of secure national review examination required.
Prerequisite: RCP 337.

RCP 371 Case Conference/Simulation I
(3-0-3)
Case conference designed to facilitate critical thinking. Problem oriented learning models investigate decision making in clinical simulations of adult, neonatal and pediatric mechanical ventilation.
Prerequisite: RCP 304.

RCP 372 Case Conference/Simulation II
(4-0-4)
Students prepare and present case studies and deliberate regarding medical decision making in cardiovascular and neuromuscular clinical simulations.
Prerequisite: RCP 371.

RCP 373 Case Conference/Simulation III
(5-0-5)
Capstone course. Students present a case to physicians and the public. Includes posting of work to a public Web site. Resume preparation and participation in employment interview. Clinical simulations, Passage required of Clinical Simulation, RRT Written and the final examination.
Prerequisites: RCP 386, RCP 362, RCP 372.

RCP 385 Advanced Mechanical Ventilation
(3-3-4)
Description and analysis of the adult patient-mechanical ventilator system including the initiation, assessment, management and discontinuation.
Prerequisite: RCP 304.

RCP 386 Critical Care
(5-0-5)
Prerequisite: RCP 337.

RCP 388 Neonatal and Pediatric Respiratory Care
(3-3-4)
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 National Academy of Pediatrics.
Prerequisite: RCP 241.

RCP 389 Critical Care
(5-0-5)
Prerequisite: RCP 337.

RCP 390 Case Management/Credentials I
(0-36-12, FWS)
Students must complete three terms (nine months) of clinical experience in both adult and neonatal respiratory care, to include cross-disciplinary communication and management of mechanical ventilation, hemodynamics, oxygen and aerosol therapy, advanced cardiac life support, newborn resuscitation in the obstetrical unit, emergency room and pulmonary physiology laboratory. Optional limited experience may be available in polysomnography, home care, pulmonary rehabilitation and research. Requires advanced levels of competence in mechanical ventilation and patient management in the adult critical care units. Students under the direct supervision of qualified respiratory therapists and physicians.
Prerequisite: For RCP 450—completion of all academic coursework in the Respiratory Care Program prior to the senior year. 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. For RCP 451—RCP 450; for RCP 452—RCP 451.
Corequisite: For RCP 450—RCP 440; for RCP 451—RCP 441; for RCP 452—RCP 442.

RCP 441 Case Management/Credentials II
(3-0-3)
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. National examination required.
Prerequisite: RCP 440.

RCP 442 Case Management/Credentials III
(3-0-3)
Current clinical cases used as the basis for scholarly research and discussion. Students complete work on senior project in the fields of respiratory care, including formal presentation of the project. Passage of two national examinations required.
Prerequisite: RCP 441.

Courses with the following notation fulfill the appropriate general education requirements:

H – Humanities
C – Communication
SS – Social Science.

For more information see page 45.
RCP 473 Clinical Education
(0-9-3)
Reflective and experiential study and collaborative investigation of the art of education in the clinical environment. Critically responsive teaching and other models are discussed and practiced by licensed, Registered Respiratory Therapists. Participants provide clinical education through their employment.

RCP 482 Clinical Leadership
(0-6-2)
Systematic reflective study of leadership theory applied in the clinician's own work environment. Leadership tools and theory applied to improvement of healthcare delivery and education. Prerequisite: RCP 461.

RCP 483 Clinical Leadership Technologies
(0-6-2)
Reflection and practice in the application of technology. Licensed Registered Respiratory Therapists develop and use technology to improve instruction. Prerequisite: RCP 461.

RCP 486 Extreme Physiology
(2-0-2)
Physiologic adaptations to gas exchange and transport which occurs during the challenges of neonatal transition, exercise, high altitude and high-pressure environments. Prerequisite: RRT credential and admission to degree completion program.

RCP 487 Expert Mechanical Ventilation
(2-0-2)
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. Prerequisite: RRT credential and admission to degree completion program.

RCP 488 Respiratory Care Innovations
(2-0-2)
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 and education. Prerequisite: RRT credential and admission to degree completion program.

(RDSC) Radiologic Science

RDSC 105 Radiation Protection and Radiographic Quality Control
(3-0-3)
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, RDSC 207, RDSC 307, RDSC 407 Seminar
(Hours to be arranged each term.)

RDSC 201 Imaging Techniques I
(3-3-4)
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
(3-3-4)
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. Corequisites: RDSC 210, RDSC 272.

RDSC 205 Patient Care
(3-3-4)
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 210 Radiographic Positioning I
(3-3-4)
Demonstration and practice of the routine and special radiographic positions of the upper and lower extremities excluding the shoulder and pelvic girdles. Prerequisite: RDSC 201 and RDSC 235 with grade “C” or better. Corequisites: RDSC 202 and RDSC 272.

RDSC 211 Radiographic Positioning II
(3-3-4)
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 with grade “C” or better. Corequisite: RDSC 233.

RDSC 233 Contrast Media Procedures
(3-3-4)
Routine radiographic examinations of the urinary system, gastrointestinal biliary system, respiratory system, and nervous system, using various contrast media 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, and RDSC 272 with grade “C” or better. Corequisite: RDSC 211.

RDSC 235 Equipment Operation and Maintenance
(3-0-3)
Basic components and operation of radiographic, fluoroscopic, and mobile units. Evaluation, calibration, and maintenance of radiographic equipment and accessories. Corequisite: RDSC 201.

RDSC 272 Radiation Protection
(3-0-3)

RDSC 301 Radiographic Positioning III
(3-3-4)
Demonstration and practice of routine and special radiographic positions of the skull, facial bones, and paranasal sinuses. Prerequisites: RDSC 211 and RDSC 233 with grade “C” or better. Corequisites: RDSC 320, RDSC 331.
RDSC 320 Surgical, Trauma and Mobile Radiography

(3-3-4)
Routine radiographic examinations of the reproductive, muscular, 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. Corequisite: RDSC 301.

RDSC 326 Cardiovascular/Interventional Technology

(3-3-4)
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 with grade “C” or better.

RDSC 331 Nuclear Medicine

(3-0-3)
Principles of radioactivity, radiometric analysis, methods of detection, uses of radionuclide techniques in biological problems. Special emphasis is given to modern imaging systems and procedures used currently in clinical nuclear medicine.

RDSC 350 Bones: The Interactive Anatomy and Position Course

(2-0-2)
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, RDSC 301, or Registered Radiologic Technologist.

RDSC 354 Mammography

(3-3-4)
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

(3-3-4)
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 simulation is included. Prerequisite: BIO 335.

RDSC 356 Magnetic Resonance

(3-3-4)
Physics and principles used in the production of magnetic resonance images and spectroscopy. Static magnetic fields, gradient magnetic fields, secondary coil fields, nuclear magnetic resonance (NMR), spatial domain, frequency domain, computer data acquisition, relaxation times, pulse sequence diagrams. Laboratory simulation is included. Prerequisites: BIO 335 and PHY 201 or PHY 217 all with grade “C” or better.

RDSC 365 Advanced Quality Assurance/Quality Control

(3-3-4)
Principles of diagnostic radiographic quality assurance systems including: quality control testing, equipment calibration, preventive maintenance, and government regulations. Laboratory experiments involve QC tests and measurements. Prerequisites: RDSC 202, RDSC 272.

RDSC 366 Radiographic Pathology

(3-0-3)
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. Prerequisite: BIO 336.

RDSC 371 Medical Ultrasound

(3-0-3)
Ultrasound physics, instrumentation and their effect upon imaging, quality assurance and bioeffects are presented and discussed. Pre- or corequisite: BIO 335 with grade “C” or better.

RDSC 388 Externship Preparation

(2-0-2)
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. Prerequisites: RDSC 326, RDSC 371 with grade “C” or better. Corequisites: RDSC 355; RDSC 356; RDSC 354 or RDSC 365.

RDSC 410 Radiologic Science Externship

(0-40-15)
Students must complete four terms (12 months) of clinical experience in both general radiography and special imaging modalities, to include computed tomography, magnetic resonance imaging, ultrasound, nuclear medicine and/or cardiovascular interventional technology at an affiliated clinical site. Students will complete all phases of general radiography and a maximum of 12 weeks in the special imaging modalities. Students under the direct supervision of qualified radiographers and radiologists. Prerequisites: All academic coursework in the Radiologic Science curriculum.

RDSC 411 Special Radiologic Science Externship

(0-40-15)
This one-term (three-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: The student must have completed all academic coursework in the Medical Imaging program with grade “C” or better and be a Registered Technologist.
RDSC 411A, RDSC 411B Special Radiologic Science Externship
(411 A, 0-18-7)(411B, 0-22-8)
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.
Prerequisite: Be an ARRT registered technologist in good standing, and have completed all the academic coursework in the Medical Imaging curriculum with grade “C” or better.

RDSC 471 Clinical Imaging Education I
(1-0-1)
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)

(SOC) Sociology

SOC 107, SOC 207, SOC 307, SOC 407 Seminar
(Hours to be arranged each term.) SS

SOC 204 Introduction to Sociology
(3-0-3) SS
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 210 Marriage and Family Living
(3-0-3) SS
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 304 Criminology
(3-0-3) SS
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.

(SPAN) Spanish

SPAN 101, 102, 103 First Year Spanish
(4-0-4)
An introduction to elementary Spanish. A three-term 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, SPAN 207, SPAN 307, SPAN 407 Seminar
(Hours to be arranged each term.)

SPAN 201, 202, 203 Second Year Spanish
(4-0-4) H
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, 202, 203 taken in sequence or instructor consent.

(SPE) Speech

SPE 107, SPE 207, SPE 307, SPE 407 Seminar
(Hours to be arranged each term.)

SPE 111 Fundamentals of Speech
(2-2-3) C
Projects in public speaking with emphasis on content, organization, and speaker adjustments to various situations; dynamics of the speaker-listener interaction; and appropriate language usage. Exercises in listening, criticism, logic, support, and ethics.

SPE 314 Argumentation
(2-2-3)
Argumentation as part of human interaction and inquiry. Examination of arguing to gain adherence and as a way of reasoning. Practice in public speaking, debate, ethics and critical thinking.
Prerequisite: SPE 111.

SPE 321 Small Group and Team Communication
(2-2-3) C
Instruction and experience in decision making through group processes with objectives of developing competent team leaders and participants. Participation in and evaluation of a variety of group communication exercises.
Prerequisite: SPE 111.

(VAS) Vascular Technology

VAS 107, VAS 207, VAS 307, VAS 407 Seminar
(Hours to be arranged each term.)

VAS 210 Vascular Physical Principles and Instrumentation I
(3-3-4)
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.

VAS 211 Vascular Physical Principles and Instrumentation II
(3-3-4)
Advanced physical principles. Hemodynamics, Doppler physics, color imaging, and artifacts associated with them are covered. Digital signal and image processing and bioeffects are also discussed. Laboratory develops instrumentation skills.
Prerequisite: VAS 210 with grade “C” or better.

VAS 214 Vascular Anatomy
(3-3-4)
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.
Corequisite: BIO 220 and PHY 217.

VAS 225 Patient Management Practices
(2-3-3)
Current issues in the practice of vascular technology with emphasis on basic concepts of patient care, infection control procedures, and the technologist’s responsibility to the patient, the patient’s family, and the vascular technology profession.
Prerequisites: BIO 347, VAS 210, VAS 245, VAS 335.
Corequisites: VAS 211, VAS 246.
VAS 245 Peripheral Venous Disease  
(3-3-4)  
Investigation of the pathophysiology of venous disease with emphasis on theoretical and practical considerations of diagnostic methods of venous testing. These include clinical assessment, plethysmography, and duplex imaging of lower and upper extremity veins.  
Prerequisites: BIO 220, BIO 346, PHY 217, VAS 214.  
Corequisites: BIO 347, VAS 210, VAS 335.

VAS 246 Peripheral Arterial Disease  
(3-3-4)  
Investigation of the pathophysiology of arterial occlusive disease with emphasis on the theoretical and practical considerations of diagnostic methods of arterial testing. These include clinical assessment, physiological evaluation, and duplex imaging of lower and upper extremity arteries.  
Prerequisites: BIO 347, VAS 210, VAS 245, VAS 335.  
Corequisites: VAS 211, VAS 225.

VAS 335 Radiographic Vascular Anatomy  
(3-0-3)  
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: BIO 220, BIO 346, PHY 217, VAS 214.  
Corequisites: BIO 347, VAS 210, VAS 245.

VAS 337 Survey of Echocardiography  
(3-0-3)  
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, BIO 246.

VAS 365 Abdominal Vascular Disease  
(3-3-4)  
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.  
Prerequisites: VAS 211, VAS 225, VAS 246.  
Corequisite: VAS 337.

VAS 366 Special Circulatory Problems  
(3-3-4)  
Diagnostic methods of testing the efficacy of vascular surgical procedures (including arterial bypass grafts, interventional radiographic procedures, organ transplants, and dialysis access grafts). Vein and arterial mapping prior to bypass surgery including IMA evaluation, intravascular ultrasound, pseudoaneurysm compression, and compartment syndrome.  
Prerequisites: VAS 337, VAS 365.  
Corequisites: VAS 337, VAS 365.

VAS 367 Cerebrovascular Disease  
(3-3-4)  
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: CHE 210, VAS 366, VAS 375.  
Corequisites: VAS 385, VAS 388.

VAS 375 Survey of Abdominal Sonography  
(3-0-3)  
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.  
Prerequisites: VAS 265, VAS 337.  
Corequisites: CHE 210, VAS 366.

VAS 385 Vascular Laboratory Management  
(3-0-3)  
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.  
Corequisites: VAS 367, VAS 388.

VAS 388 Externship Preparation  
(2-0-2)  
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, VAS 375 with grade “C” or better.  
Corequisites: VAS 367, VAS 385.

VAS 420 Vascular Technology Externship  
(0-40-15)  
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.  
Prerequisites: All academic coursework in the Vascular Technology curriculum.

(VWI) Writing

WRI 107, WRI 207, WRI 307, WRI 407 Seminar  
(Hours to be arranged each term.)

WRI 115 Introduction to Writing  
(3-0-3)  
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.  
Prerequisites: Writing ability as demonstrated by SAT/ACT score and/or writing sample.

WRI 121 English Composition  
(3-0-3) C  
Introduction to critical reasoning and analysis. Students explore connections between thesis, structure, tone and purpose; practice the writing process; and apply rhetorical strategies. Focus on academic reading, writing and research skills.  
Prerequisite: Writing ability as demonstrated by SAT/ACT score and/or writing sample.
WRI 122 English Composition (3-0-3) C
Designed to develop skills in ethical argument, research, and critical thinking. Multi-page papers, including an argumentative research paper, required. Students draft, compose, organize, and revise with focus on audience, effective style, and overall rhetorical effect. Prerequisite: WRI 121 with grade “C” or better.

WRI 123 English Composition (3-0-3) C
The formal research paper. Designed primarily for students in the college transfer program but may be taken as an elective by students in any curriculum. Prerequisite: WRI 122. Pre- or corequisite: SPE 111.

WRI 214 Business Correspondence (3-0-3) C
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. Prerequisites: WRI 122 or equivalent, and keyboarding ability.

WRI 227 Technical Report Writing (F,W,S)(3-0-3) C
Practice in techniques of gathering, organizing, and presenting technical information. Technical reports derived from realistic situations found in the student’s major will be written. Prerequisite: WRI 122. Pre- or corequisite: SPE 111.

WRI 305 Writing for the Marketplace (As required)(3-0-3) C
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 321, WRI 322, WRI 323 Advanced Technical Communication (S,F,W)(1-0-1) C
Processes involved in technical communication; presents suggestions for solutions to the variety of problems emanating from junior project situations. This sequence is to be taken in consecutive terms (S,F,W) and is offered for the convenience of students whose junior or senior projects require a full year for completion. The three-term sequence substitutes for WRI 327. Prerequisite: WRI 227. Corequisite: Senior project.

WRI 326 Technical Communication for Health Care Professionals (3-0-3)
Advanced experience and practice in technical communication with emphasis on documentation related to the health care profession. A distance education course offered to students pursuing health-related degree completion programs. Prerequisite: Introductory technical writing course or equivalent.

WRI 327 Advanced Technical Writing (F,W,S)(3-0-3) C
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 Technical Journalism (2-3-3) C
Production of a weekly newspaper (The Edge). Includes journalistic writing, design, layout, and production, as well as proposals, memos, business correspondence, and recommendation reports. May substitute for WRI 327 with approval of student’s major department. Prerequisites: WRI 227 and consent of instructor and adviser.

WRI 350 Documentation Development (3-0-3) C
Provides students with basic tools for preparing documentation. Course focuses on usability of the documentation and covers planning and scheduling, audience evaluation, use of appropriate examples and illustrations, style, editing technique, organization and research. Prerequisite: WRI 227.

WRI 410 Proposal and Grant Writing (3-0-3) C
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 (3-0-3)
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 (2-3-3)
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: WRI 227, SPE 111, word processing ability.

Courses with the following notation fulfill the appropriate general education requirements: C – Communication, H – Humanities, SS – Social Science. For more information see page 45.


**Academic Records**

Marla Edge, *Registrar and Director of Academic Agreements and Articulations*

Wendy Pedersen, *Associate Registrar and Institutional Residency Officer*

*Snell Hall, 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 OIT 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 adviser’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 Registrar by the last day to register or add courses for the current term.

OIT 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 OIT 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 OIT’s *Web for Student* and also available in the office.
Athletics, Recreation and Fitness

Mike Schell, Director

PE, Room 116
(541) 885-1634
michael.schell@oit.edu

The Oregon Tech Athletic Department as well as the Tech Fit Center mission is to facilitate growth and development of students by providing 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 Tech-Fit facilities and educational classes offered. OIT's Athletics, Recreation and Fitness Education Center has many facilities, fitness and education opportunities. An expansion off the front of the center provides students with a larger cardiovascular workout area. A free-weight room stocked with all the needed equipment is located downstairs on the east side. A six-lane, 25-meter swimming pool is used for swim teams and water polo as well as lap swimming and open recreation. There are six tennis courts (four lighted), an eight-lane, 400-meter, all weather surface track and a lighted basketball court for your 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 and track; women's volleyball, women's softball and men's baseball.

The Tech Fit Center and athletics are financed by revenues generated from the programs' operation as well as from Incidental Fees, Oregon State Lottery funds, State General Appropriations and contributions from the community through the OIT Foundation or Oregon Tech Athletic Association.

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.

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 Institute of Technology 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 885-1390 for information about intramural sports programs or see the Web site for rosters and information.

Tech Fit
The Tech Fit Center is free to all OIT students enrolled in eight or more credits per term. Students taking less than eight credits or community members may sign up in either credit or non-credit classes for a minimal charge. For more information call 885-1634.

The Paper Owl

Lane Hickman, Director

College Union
(541) 885-1050
paperowl@oit.edu

The Paper Owl is a full-service campus store owned and operated by OIT. The operational philosophy allows prices on course books to average considerably less than those found at most university bookstores. Besides course books, the Paper Owl carries a wide variety of contemporary items that students prefer: school, office and dorm supplies, scientific and business calculators, writing instruments, drafting supplies, emblematic clothing and gifts, computer supplies, electronic parts and useful reference books, among others.

The Paper Owl services include its popular book reservation program. Students submit a reservation form and bookstore staff reserve requested titles. Students may pay for the books at the time of pick up, or prepayment may be arranged with the Student Charge Plan, eliminating the need to stand in a long line.

The Paper Owl has a high percentage of used books in stock. The book buy-back program, also very popular, allows students to sell back many books they do not want to keep after taking a course. Other services include gift wrapping and special pricing programs on computer software, electronic parts and calculators. Friendly service is the hallmark of The Paper Owl. Students can order or reserve their course books and shoppers can order merchandise on the bookstore's Web site at www.bookstore.oit.edu.
Affirmative Action and Equal Opportunity

Ron McCutcheon, Affirmative Action Officer

Snell Hall, Room 108
(541) 885-1108

The Affirmative Action Officer is charged with oversight and enforcement of OIT’s compliance with relevant federal, state and university civil rights statutes and regulations. Complaints and grievances related to unlawful discrimination and harassment under Title IX, the Civil Rights Act, the Rehabilitation Act, the Americans With Disabilities Act and employment law are to be directed to the Officer for resolution. The Officer also coordinates OIT’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 OIT policies on discrimination, harassment, equal opportunity or access to programs and services should be directed to this office, located in the Human Resources Office in Snell Hall.

Assessment

Beth Murphy, Director

Purvine Hall, 185
(541) 885-1141
beth.murphy@oit.edu

OIT actively engages in assessment of both degree programs and broad institutional student learning outcomes (ISLOs). The director of Assessment, in conjunction with the Executive Committee of the Assessment Commission, leads the campus in these efforts.

Assessment coordinators for each undergraduate and graduate degree program create an assessment plan 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 OIT Web site at www.oit.edu/provost/learningoutcomes.

OIT faculty also assess the ISLOs, which are intended to reflect common themes from departmental and program learning outcome statements. These outcomes are consistent with OIT’s mission and objectives. Specifically, the ISLOs reflect institutional Objective 2, which states that an education from OIT will enable students to be effective communicators, responsible citizens and lifelong learners by assisting them in the development of critical thinking, problem solving skills and ethical and cultural awareness.

Career Services

Robin Thompson, Director of Alumni Relations and Career Services
Jan Goodyear, Recruitment Manager

Learning Resource Center, 233
(541) 885-1020
career@oit.edu

The Career Services Office supports student and alumni efforts to develop and achieve career goals. Services include: individual career advising; workshops and classroom presentations on résumé-writing, job interviewing, job search and applying to graduate school; on-campus employer recruitment, whereby companies and government agencies interview students for career and internship opportunities; Career Fairs, which bring employers and students together on campus to discuss career opportunities informally; career-resource materials and job listings; and a résumé referral service, which supports student applications for employment and graduate school.

Career Services also coordinates the Student Employment Service, which provides part-time employment for students both on and off campus with local employers. Positions are available through the College Work-Study program or through regular employment.

Campus Dining

Christopher Dalla, Director
James Dernbach, Dining Manager

College Union, 207
(541) 885-1065
chris.dalla@oit.edu

Campus Dining offers the entire campus community a wide variety of food choices for take-out or to eat-in at the Marketplace Cafe, upstairs in the College Union. The Tech Express declining-balance program is available to commuters, faculty and staff. The Tech Express is convenient, offers bonus dollars on deposits to help stretch individual budgets and can be charged to students’ individual accounts. Other options are available at the Bistro espresso shop in the College Union or the new espresso shop in the Martha Anne Dow Center for Health Professions or Duffie’s espresso cart in Purvine Hall; there is also a Subway sandwich shop in the College Union. Campus Dining offers soups, salads, sandwiches, burgers and many other options throughout the day. To help students with college expenses, the Campus Dining operation employs more than 80 student workers.
College Union
Christopher Dalla, Director
Michael Hubbard, Manager

Information Desk, CU 116
(541) 885-1030
www.oit.edu/collegeunion

The College Union is the center of student activity on campus. Located within the Union are the student government offices, Campus Arts and Entertainment, the Diversity Center, Student Services staff, Campus Dining operations, The Edge student newspaper, the Paper Owl bookstore, the campus mail center, the Outdoor Program, the Women's Resource Center 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, concerts and dinner theaters, art 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
Joan Loustalet, Director
Mariana Peoples, Academic Specialist

Learning Resources Center, 228
(541) 885-1129
(541) 885-1072 - text telephone
www.oit.edu/ds

The Office of Disability Services coordinates academic, housing and program services accommodations for students with documented physical, learning, sensory, psychiatric and other disabilities. Students with disabilities who anticipate needing services on campus should contact this office well in advance of attendance at OIT to arrange for timely services.

Document Resource Center
Heather Reynolds, Supervisor

College Union
541-885-1059

Operated by Ikon Financial Systems, the DRC is a one-stop shop for graphic design, printing and bulk mailing needs. Services are available to faculty, staff, students and the OIT community.

Black and white, color, digital printing as well as laminating, comb binding and shredding are available at low costs. Electronic job submission provides the campus with access to services and completed jobs can be delivered to campus mail boxes 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 a.m. to 6 p.m. Monday through Friday during the academic terms. During college breaks, operational hours are 7 a.m. to 5 p.m.

Geo-Heat Center
John W. Lund, Director
Tonya L. Boyd, Assistant Director
Gene Culver, Mechanical Engineer

Boivin Hall, 102
(541) 885-1750
geoheat@oit.edu

The Geo-Heat Center, established in 1975, 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, downhole heat exchangers, heat pumps, agri-business applications, low-temperature Rankine cycle generators and resource assessment.

The Center provides technical assistance for geothermal projects in the area of equipment and materials selection, feasibility studies, design, troubleshooting and economic evaluations. This program is sponsored by the U.S. Department of Energy and the State of Oregon and provides training sessions and information dissemination about the direct applications of geothermal energy, small-scale power generation and ground-source heat pumps.

The Center publishes the Quarterly Bulletin, technical papers, software and monographs on geothermal energy. 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, International Ground-Service Heat Pump Association and the International Geothermal Association. An extensive Web site on geothermal energy is available at: geoheat.oit.edu.

Information Technology Services
Andy Abbott, Chief Information Officer

Boivin Hall, 123
(541) 885-1720
(541) 885-1470 Help/Service Desk

Information Technology Services provides computing and telecommunications resources for the OIT campus. Primary service and support areas include e-mail and network storage for all students, faculty and staff; broadband network connectivity between all OIT buildings; and advanced technology services such as wired and wireless Internet connections, Internet 2 and interactive videoconferencing. In conjunction with OIT 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 OIT campus.
OIT offers more than 500 computers available for student use in 49 computer labs on the Klamath Falls campus. The Portland Metro and West campuses have more than 100 computers for student use in 10 computer labs. ITS supports the computers in campus laboratories and classrooms to insure proper function and availability for faculty and students.

Klamath Community Television

Josh Rindfleisch, Senior Field Producer

Learning Resource Center, 250
(541) 885-1801

Production Assistance
(541) 885-1799

The community television station is housed on the second floor of the Learning Resource Center. Funded by cable television franchise fees from Klamath County and the City of Klamath Falls, Klamath Community Television's mission is to educate, inform and entertain. The station produces and cablecasts public, educational and governmental programs primarily for the residents of Klamath County, but for wider distribution as well.

Klamath Community Television strives to create local programming to promote Klamath County and the City of Klamath Falls. Some of this local programming has included: Reflections on a Dream: People of Archaeology on the Williamson River Delta, The Diary of a Dairy, The Klamath Water Resource, Best Science for the Klamath Basin, city and county police department studio shows, Keno fire safety videos and Archaeology on the Williamson River Delta just to name a few. In addition, the station also televises local city council, city planning and county commissioner meetings. In 2005, KCTV was awarded the Telly Award for its production of Mother Goose and Friends. The Telly Awards honor local, regional and cable television programming.

Library Services

Karen Kunz, Interim Library Director
Anne Hiller Clark, Instructional Services and Shaw Librarian
Dawn Lowe-Wincentsen, Portland Operations Librarian
Karen Kunz, Access Services and Systems Librarian
Kelly Peterson, Instructional Services Coordinator and Digital Projects Librarian
Alla Powers, Reference Services Coordinator
Iris Godwin, Technical Services Librarian
Lia Vella, Reference and Special Projects Librarian

Library

Located in the LRC, the Library offers public computers, individual and group study spaces and a computer lab. The Library contains approximately 150,000 volumes, including government documents; access to more than 18,000 print and electronic journals; and unique digital collections relating to the Klamath River Watershed and Crater Lake National Park. Online catalogs provide access to the collections of the OIT Library, regional academic libraries and to library resources worldwide. The Library's many Web-based databases offer students access to extensive information sources. All of the Library's electronic resources are available campus-wide and via remote access to promote student learning regardless of location. Research services include print and electronic reserves, interlibrary loans and individual research assistance. The librarians offer class-related instruction in the use of the Library and information resources, workshops on various topics, classes in research methods and tours. For librarian assistance, call (541) 885-1773.

OIT Portland

Library services are also available at the OIT Portland locations, which share access to all of the Main Library's electronic resources. To reach the Portland Operations Librarian, call (503) 821-1258.

Shaw Historical Library

The Shaw Historical Library, established in 1983 by Laurence and Dorothy Shaw, houses collections of books, art, maps, manuscripts, photographic images and other materials pertaining to the history cultures and natural history of the Land of the Lakes—Southern Oregon, Northern California and Northwestern Nevada—from prehistory to the present. The Library's activities and publications, including the Journal of the Shaw Historical Library, focus on all aspects of the history and natural history of the region. The Library is located on the second floor of the LRC. To reach the Shaw Librarian, call (541) 885-1686.

OIT Mail Center

College Union
541-885-1670

As a commercial mail outlet, the OIT Mail Center serves the campus community by offering mailing services and supplies, postal mail boxes and UPS shipping services. Mail Center hours are from 8 a.m. to 5 p.m. Monday through Friday. The Mail Center is located inside the Paper Owl Bookstore in the College Union.

Media Services Center

Sharon Hanson, Coordinator

Learning Resources Center, 237
(541) 885-1785
sharon.hanson@oit.edu

The Media Services Center provides technical and material support for faculty, students and administrators by providing audiovisual and computer/projection equipment to classrooms, videotaping speech classes, classroom guest speakers and NAIA sports events. Services also include audio- and video-tape duplication, repair of AV equipment and training of faculty and students on new and specialized classroom equipment.
Oregon Renewable Energy Center

Tom Chester, Director

Purvine Hall, 270
(541) 885-1883
tom.chester@oit.edu

The Oregon Renewable Energy Center 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 practical information. The Center also encompasses OIT’s Geo-Heat Center. OREC draws its strong technical expertise from the OIT 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.
- **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 options to gasoline and diesel 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.

Renewable Energy Engineering Degree Program

The Renewable Energy Engineering undergraduate degree program offered by OIT is the only one of its kind in the United States. In addition to the REE courses, the general OIT curriculum includes classes and laboratories in renewable energy and sustainability that are available to students in other disciplines. The REE degree is delivered on OIT’s Portland and Klamath Falls campuses.

Public Relations

Valeree Lane, Director

Snell Hall
(541) 885-1160
valeree.lane@oit.edu

The Office of Public Relations promotes the university at local, state, regional and national levels through media, community and governmental relations. Public Relations works in conjunction with many departments to ensure key marketing messages are received by internal and external constituents and the general public.

Public Relations prepares official marketing and collateral materials for university use. Key among these are admissions and enrollment marketing literature, the General Catalog, President’s Report and program brochures.

Helping to build unity and recognition through advertising and marketing, the Public Relations Office is involved with developing advertising and marketing using key messages which are strategically placed. Additionally, the Public Relations Office is responsible for creating and maintaining a graphic identity program which defines standards for the use and display of the university’s primary identifiers.

Public Relations produces and transmits tech news DAILY, an electronic newsletter circulated throughout the OIT community of faculty, staff and students.

Small Business Development Center

Jamie Albert, Director and Counselor

Boivin Hall, 119
(541) 885-1760
sbdc@oit.edu

Established in 1984, the Small Business Development Center provides free, confidential advice to businesses in Klamath and Lake Counties. Areas of emphasis include start-ups, existing concerns, expansion and operations improvement.

Business counseling is done by the Center’s director and by OIT faculty, who are hired by the director to meet a client’s specific needs. In addition to consultation services, the Center co-sponsors workshops in the local business community. Most workshops are offered at a nominal fee.

The Small Business Development Center is funded through the federal Small Business Administration, state lottery funds and OIT. Approximately 200 businesses use the Center each year.
University Services

Student Affairs

Erin M. Foley, Vice President for Student Affairs
Connie I. Dernbach, Executive Secretary

College Union 217
(541) 885-1010
www.oit.edu

An integrated program of support services and supervision of student life is offered by the Office of Student Affairs. These programs and services include: Admissions, Alumni Relations and Career Services, the Center for Learning and Teaching (CFLAT), Disability Services, Financial Aid, Housing and Residence Life, Integrated Student Health Center, Tech Opportunities Program (TOP) and Campus Life and Student Government (ASOIT).

The Vice President for Student Affairs and her staff maintain close relationships with students and student organizations and are available for consultation and collaboration on all matters pertaining to student well-being.

Center for Learning and Teaching (CFLAT)

Angela Aguiar, Director
Sam Murphy, Student Success Coordinator
Laura Reid, CFLAT Coordinator
Shellie Wilson, CFLAT Retention Coordinator

Learning Resources Center, 229
(541) 885-1791
www.oit.edu/cflat

The Center for Learning and Teaching is a multi-purpose facility designed to enrich both learning and teaching at OIT. CFLAT provides tutoring in many academic subjects, academic success classes, accommodations for students with disabilities, test proctoring, a computer laboratory and the campus writing center. A media collection and a video system used in conjunction with academic classes are also housed at the Center. In addition, CFLAT coordinates new student registration for the Klamath Falls campus, as well as new faculty orientation workshops, including the September Institute for New Faculty. It provides ongoing support for faculty to help improve teaching effectiveness and instructional skills. CFLAT is an integral part of OIT’s student success initiatives. Placement testing and some other standardized testing programs are also offered.

Housing and Residence Life

Mandi Clark, Director of Housing and Residence Life

Housing Office Residence Hall, A 151
(541) 885-1094
housing@oit.edu
www.oit.edu/housing

Housing and Residence Life encourages self-responsibility, a necessary ingredient for the accomplishment of academic, social and personal objectives. Accordingly, every attempt is made to provide the environment to accomplish this aim. Studies have indicated that much of the knowledge required for success in life is gained outside the classroom. OIT’s Housing and Residence Life program provides a vital aspect of a student’s educational experience. 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 make arrangements for room and board, receive assistance with personal matters, consult with the program staff, make suggestions for improvements, work out financial details and receive assistance for a variety of related housing concerns and interests.

Residence facilities at OIT are operated on a self-supported financial basis and house up to 450 male and female students. Living in college housing relieves the student of many time-consuming and expensive tasks, including meal preparation, dish washing and other housekeeping chores and driving to and from campus. With this extra time and financial savings, students are better able to devote more energy to their studies, to independent and non-academic learning experiences, to recreational and stress-relieving pursuits and to making new and often lifelong friends.

Information about on-campus housing is sent to all students admitted to OIT. The meal account for residents is either a declining points plan or declining dollar plan. Students living on campus for the first time must sign up for the points plan. If you need a housing or meal plan application, please contact the Housing and Residence Life Office.

Applications for on-campus housing should be completed and returned as soon as possible to the Housing and Residence Life Office. While space is guaranteed to new students who apply before May 1, late applicants may not receive a housing assignment.

Room-and-Board Rates

Room-and-board charges at OIT are approved by the Oregon State Board of Higher Education and are announced publicly after approval. Current rate information and any other information concerning housing and Campus Dining operations can be obtained from the Housing and Residence Life Office, OIT, 3201 Campus Dr., Klamath Falls, OR 97601-8801, or online at: www.oit.edu/housing.
Integrated Student Health Center

Alden B. Glidden, M.D., Medical Director
Marilyn Gran-Moravec, R.N., M.S.N., Administrative Director

Semon Hall, 115
(541) 885-1800
(541) 885-1866 fax
health@oit.edu

The Student Health Center, 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 credit hours are entitled to and encouraged to use the Health Center. Other students can use the Health Center by paying the health fee.

Health Requirements to Register

The following health requirements must be fulfilled before registration. Documentation of requirements must be submitted to the OIT Integrated Student Health Center. 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 for courses.

1. A completed Health History form that includes a completed Tuberculosis Risk Assessment. This form is mailed to all students when they confirm registration.

2. Evidence of adequate immunizations (e.g., official immunization record, signed statement by a physician, immunizations on official high school transcript, etc.):
   - Adacel or Diphtheria-tetanus booster within the last 10 years.
   - Two doses of measles/mumps/ rubella vaccine (MMR) are required by Oregon Law (ORS 433.282) for all full-time college students born on or after January 1, 1957. The first dose must be given after the first birthday. The second dose must be after 1989.
   - Hepatitis A/B, polio, varicella (chickenpox), and meningococcal vaccines are strongly recommended.

Services

Medical Clinic

OIT’s Student Health Center health care providers are committed to providing high quality, personalized care. The medical clinic is staffed by a physician, nurse practitioner, registered nurses and office assistants. Diagnosis and treatment of acute and chronic illnesses, birth control and emergency contraception, routine laboratory procedures, immunizations, pharmacy, 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 a low cost for medications, laboratory work 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 credits. Students enrolled for five or fewer credits can receive one free assessment session, and then may access additional services by paying the Student Health fee.

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.

Wellness Programs

A Health Educator is on staff to assist students in staying healthy and fit while attending OIT. 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 Student Health Center 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 SHC. Students provide input on programs and services provided, generate new ideas and participate in wellness and promotion events. All students are welcome to apply to join this committee. SHAC meets on a monthly basis during the academic school year. Call or visit the Student Health Center to apply.

Peer Health Educator Program

The OIT Peer Health Education Leadership program gives students the opportunity to develop public speaking, leadership, and public health skills while providing a resource for health information to the OIT community. The mission of the program is “Helping people make informed, voluntary, health-promoting behavior changes.” Student volunteers are called Peer Health Educators (PHEs), who work with peers through education and outreach. They receive training to gain facilitation skills, public speaking experience and knowledge about college health issues. Students in good academic standing and with sophomore status or above may apply during Winter Term. Opportunities for others to volunteer and assist PHEs are available throughout the year. For more information, visit www.oit.edu/health/peerhealthed.

Fees/Charges

Students taking six or more credit hours pay a Student Health fee. 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. 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. A student’s Business Office account is billed for these charges. No cash is necessary at the time of visit. All medical expenses rendered outside the Student Health Center from private physi-
cians or hospitals are the student’s financial responsibility.

**Student Health Insurance Plan (SHIP)**

OIT requires basic insurance coverage that is automatically provided for all students enrolled in nine or more credit hours during fall, winter and spring Terms. Health insurance is also available during the summer, if requirements are met. The OIT Business Office and Health Center co-manages the student insurance program, which is designed to assist with medical expenses for minor injuries and illnesses. A brochure explaining the automatic enrollment fee, benefit schedule and claims procedure is available at the SHC. Visit www.oit.edu/health for more information.

A more comprehensive Supplemental Major Health Insurance plan is also available, which provides additional coverage and major medical benefits for students and their eligible dependents. Students must also enroll in the basic insurance in order to apply for the extended insurance.

International students and students in certain programs are automatically enrolled in the Supplemental Major Health Insurance plan. A waiver is possible for students in certain health sciences programs only. (Please check with your program of study, Business Office or the Student Health Center for more information.) This form must be completed within the first 30 days of a term before a refund can be given. Once completed, the waiver will cover the entire academic year.

**Tech Opportunities Program**

Joan Loustalet, Director  
Crystal Murphy, Program Assistant  
Mariana Peoples, Academic Specialist  
Bill Proebstel, Academic Specialist  

*Learning Resources Center, 228*  
*Phone (541) 885-1125*  
*TOP@oit.edu*  
*www.oit.edu/TOP*

The Tech Opportunities Program (TOP) is a federally funded (Student Support Services TRIO) academic support program designed to assist highly motivated students who are also low income, first generation or students with disabilities. TOP staff work closely with participating 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 and related support; mentoring; networking with other students; college-success workshops and classes; additional academic advising; and limited financial assistance.

**Student Development**

Jane Rider, Director, Student Development,  
(541) 885-1389  
Deanne Pandozzi, SEVIS Coordinator and  
Student Programs Assistant, (541) 885-1847  
Chris Frazier, Student Programs Coordinator  
(541) 885-1392

*College Union, Room 108*  
*(541) 885-1825*

**ASOIT**

The Associated Students of Oregon Institute of Technology (ASOIT) invites the participation and involvement of all students in the governance process. Student involvement has been shown to correlate with academic and career success. Programs and activities are aimed at fostering a sense of community at OIT. A sense of connection and community has also been shown to correlate with student success. As a student, you can be involved in a variety of ways. You could start or join a campus club or organization, serve on a committee, run for office or apply for various student staff positions. For further information on any of these options, visit the ASOIT Web page at http://asoit.org or visit the OIT Web page (current students, campus life, student government). You may also contact Student Development at (541) 885-1828, or the director of Student Development at (541) 885-1389.

**Campus Activities**

*College Union, Student Program Suite*  
*Lounge Phone: (541) 885-1832*

Campus Activities (CA) funds quality social, cultural, arts and recreational programs for all OIT students. Funding is solely based on incidental fees and admission costs to programs are either low or free to OIT students. The CA student staff is selected during Winter Term each year.

To get involved or to apply for a position, contact Student Development at (541) 885-1392 or visit the CA Web page: www.oit.edu/campusactivities.
Diversity Center (DC)

College Union, Student Program Suite, Room 225
Lounge Phone: (541) 885-1369

The Diversity Center is located upstairs in the College Union. A lounge with new furniture, equipment, computers and a small kitchen space is available to all students. The DC provides numerous programs throughout the year including weekly coffee hours, film festivals, art exhibits and ethnic celebrations. The DC supports the International Clybin, their activities, some of which include Asian New Year and the annual International Dinner, Diversity Week activities, MLK Celebration and other speakers and entertainment.

Fraternities/Sororities

The Greeks are a long-standing presence on campus. The Alpha Sigma Alpha Sorority is currently in the formation process at OIT. The fraternity, Phi Delta Theta, is an active organization on campus. Contact the ASOIT office for more information.

Multicultural and International Student Services

College Union, Room 108
(541) 885-1389, (541) 885-1392
(541) 885-1847
Lounge Phone: (541) 885-1369

Multicultural and International Student Services are available through the Office of Student Development. The Diversity Center in the College Union provides a lounge space for all students. This department promotes policies, programs and activities that contribute to a broader understanding of people and their cultures. This office is a resource for minority and international students. A small lounge with computers is provided for students to gather, study, socialize and plan activities. Assistance is available for questions related to USCIS regulations, SEVIS and student visas, as well as personal, academic and social adjustment. The office facilitates the Leadership and Diversity Scholarship Program and provides assistance and outreach for a number of community cultural programs. These include events such as the annual International Dinner, Diversity Center Coffee Hours, an annual Diversity Week event, Cinco de Mayo, Martin Luther King, Jr., Celebration, along with various speakers, films and arts programs. In addition, advisement is provided to a variety of ASOIT recognized student clubs, including the International Student Club, Native American Club, M.E.C.h.A. and others.

New Student Orientation (NSO)

New Student Orientation (NSO) is coordinated through Student Development by a student team. This program is designed to give students a chance to meet and also socialize with professors before classes begin. NSO also provides activities, workshops, barbecues, dances and a variety of other events and information to incoming students. An Orientation packet is provided to students when they first arrive. This includes a schedule of events and activities occurring the weekend prior to the start of classes in the fall when Orientation is held. International students participate in a special International orientation with various activities during the first weeks of the term; they also meet individually with the SEVIS Coordinator and receive special welcome packets specifically designed for incoming international students. Many other campus clubs, organizations and programs volunteer time to assist with New Student Orientation. If you would like to get involved as either a volunteer or a student staff member, contact Student Development at (541) 885-1392 or www.oit.edu/orientation.

Organized Campus Clubs (OCC)

Student clubs and organizations add another important dimension to student life. ASOIT funds more than 50 recognized student organizations, including clubs related to various academic disciplines, special interests, sports, recreation, ethnic and social activities. Joining a club is a great way to meet new people and pursue common interests in a relaxed setting. A current roster of organizations is available from ASOIT or Student Development. Super Club Sign-Up is an annual event held at the beginning of the fall term, as well as at key times during the academic year. OCC representatives are an integral part of the Student Senate and all representatives attend the general meeting held at 5:30 p.m. on every second and fourth Monday of the month during the regular school year. For information on starting a club or organization, visit the ASOIT Web page at http://asoit.org or contact the ASOIT office at (541) 885-1825.

Outdoor Program (OP)

Chris Frazier, Adviser, (541) 885-1392

College Union, Student Programs Suite, Room 214
(541) 885-1834
www.oit.edu/op

The Outdoor Program (OP) provides an opportunity to participate in various outdoor activities planned for student enjoyment, including, but not limited to, rafting, caving, mountain-climbing, hiking, deep sea fishing, snowboarding and skiing. Trips are supported by the OP and students are charged low costs to participate in weekend trips and tours. No previous experience is necessary to enjoy the events the OP offers, since the activities are planned for beginners and advanced adventurers alike. In addition to sponsoring trips, the OP also offers low-cost rentals of equipment for a variety of outdoor activities. If you are planning a weekend expedition and don’t have the money to buy expensive equipment, the OP
rents canoes, tents, backpacks, cross-country skis, snowboards and more at a nominal cost. The Outdoor Program office is located on the second floor of the College Union, in the Student Programs Suite.

Student Leadership

National Society of Leadership and Success
Sigma Alpha Pi

Newly formed on campus, the Sigma Alpha Pi chapter gives students the opportunity to fulfill the requirements to become lifetime members of the NSLS. Students have the opportunity to attend national speaker presentations, network with other students within a small group and receive leadership training certification. Visit: www.oit.edu/NSLS for more information.

Student Senate

The purpose of the Student Senate is to represent the students of OIT through effective communication with all members of the university community. The Senate encourages the development of campus organizations and activities and the usage of educational, cultural, social and recreational opportunities for students. The goal of the Senate is to adequately represent and interpret student opinion as related to the information on campus policy, while promoting unity and fellowship among the students of the university community.

Students can participate within the Student Senate by getting involved with one of the many campus commissions or serving on a committee of the Student Senate. Sign-up opportunities are available during New Student Orientation by visiting the ASOIT table at the Opportunity Fair or speaking to the ASOIT President, Vice President, or the Director of Student Development. The Student Senate holds a general meeting for campus clubs at 5:30 p.m. on every second and fourth Monday of the month during the regular school year.

Student Media

Student Newspaper—The Edge

Steve Matthies, Adviser

Edge Office, College Union
(541) 885-1835

OIT’s award-winning student newspaper, The Edge, is a weekly newspaper written by students from all majors and produced by a student staff. Published fall, winter and spring terms it is distributed without charge to students. Academic credit is available by enrolling in journalism courses.

KTEC Radio Station
89.5 MHz FM

Kevin Brown, Adviser, (541) 885-1891

KTEC Office: (541) 885-1840

KTEC-FM, a 200-watt non-commercial radio station, is licensed to the Oregon State Board of Higher Education by the Federal Communications Commission and is the oldest FM station in Southern Oregon. KTEC is operated by students and programmed to serve the interests of the OIT student body and the Klamath Falls community. Throughout the school year, KTEC provides a varied program schedule of music, educational material and special events. Any student interested in radio broadcasting is encouraged to join KTEC. As KTEC staff members, students will practice and perfect their knowledge by producing both live and pre-programmed broadcasts. KTEC’s studio is located in the southeast corner of the College Union.

Oregon Technical Broadcasting (OTB)

Erin Foley, Adviser
Paul Dingman, Adviser

College Union, Room 112
(541) 885-0682
otb@oit.edu

OTB is the student-run video production program at OIT. OTB provides campus entertainment through the creation of a sketch comedy show called Outside the Box. Two new episodes are created each term. Additionally, OTB films campus events, operates the closed-circuit TV station on campus and provides video service to campus organizations that request them. Anyone interested in TV/video/film productions, acting or comedy is encouraged to get involved with OTB. No previous experience is necessary.

University Development

Vacant, Vice President
(541) 885-1130

University Development builds and enhances positive relationships with students, faculty, staff, alumni and friends of the university through 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, grant writing and other activities stimulate and convey the distinctive role and numerous educational, research and public service contributions of OIT throughout Oregon, the nation and internationally.
Alumni Relations and The Oregon Tech Alumni Association

Robin Thompson, Director of Alumni Relations and Career Services

Snell Hall, 212
(541) 885-1132
robin.thompson@oit.edu
https://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. The office of Alumni Relations also works with Career Services to assist alumni in enhancing their careers or making career changes. 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 OIT.

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 OIT. 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

Krista Darrah, Interim Executive Director

(541) 885-1130

The Oregon Tech Foundation is a nonprofit organization that provides private financial support for Oregon Institute of Technology. The Foundation is governed by a Board of Directors that represents a broad range of community leaders, alumni and private benefactors. The Foundation raises funds to enhance academic programs, to support scholarships and to enrich student life. A related responsibility of the Oregon Tech Foundation is the management of private funds entrusted to it. These funds currently total above $16 million, a large part of which is committed to the support of numerous scholarships that are awarded primarily on the basis of academic achievement and financial need. The Foundation works closely with its affiliated and associated organizations, including the Oregon Tech Alumni Association, the Shaw Historical Library and the Oregon Tech Athletic Boosters.

Veterans Services

E. Susan Richards, Veterans’ Certifying Official

Snell Hall, Registrar’s Office, lower level
(541) 885-1302

The veterans coordinator works closely with officials of the Veterans Administration to deliver educational benefits to a variety of veterans, selected reservists, dependents and survivors. All students, including new, transfer or returning, who expect to receive VA benefits must notify the veterans coordinator in the Registrar’s Office. The veterans coordinator certifies attendance at OIT.

The veterans coordinator also administers the satisfactory progress standards for students who are receiving educational benefits. See Veterans Satisfactory Progress Standards under the Academic Policies section of this catalog.
Governance
Oregon
University System

The Oregon University System includes seven institutions that provide general, professional and technical educational opportunities throughout the state.

Member institutions are Eastern Oregon University, La Grande; Western Oregon University, Monmouth; Oregon Institute of Technology, Klamath Falls; Oregon State University, Corvallis; Portland State University, Portland; Southern Oregon University, Ashland; and the University of Oregon, Eugene.

The system is governed by the Oregon State Board of Higher Education, whose members are appointed by the Governor and approved by the Senate. The Board maintains a permanent staff, headed by the Chancellor of the Oregon University System, who is appointed by the Board.

Oregon State Board of Higher Education

Members and term expiration dates:

Kirby Dyess, President, Portland, 2011
Donald W. Blair, Vice President, Beaverton, 2008
James L. Francesconi, Vice President, Portland, 2012
Tony C. Van Vliet, Vice President, Corvallis, 2012
Hannah Fisher, Portland, 2009
Brian Fox, Ashland, 2009
Paul Kelly, Jr., Portland, 2011
Dalton Miller-Jones, Portland, 2010
Rosemary Powers, La Grande, 2009
Preston Pulliams, Portland, 2009
John E. Von Schlegell, Portland, 2009
David V. Yaden, Lake Oswego, 2012

George Pernsteiner, Chancellor
Oregon Institute of Technology

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Nancy Wendt

Oregon Institute of Technology Administrative Offices

President, Christopher G. Maples
Acting Provost and Vice President for Academic Affairs, Bradley Burda
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Associate Vice President for Strategic Partnerships, Dolores “Lita” Colligan
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Interim Dean, School of Health, Arts and Sciences, Bradley Burda

Admissions, Ginny Gardiner, Interim Director
Alumni Relations, Robin Thompson, Director
Athletics, Mike Schell, Director
Budget Consultant, Haldane Harris
Business Affairs, Jan Lewis, Director
Campus Dining, Christopher Dalla, Director
Career Services, Robin Thompson, Director
Center for Health Professions, Terri Armstrong, Interim Director
Chief of Staff, Valerie Lane
College Union, Christopher Dalla, Director
Disability Services, Joan Lousalet, Director
Distance Education, Barb DeKalb, Director
Facilities Services, David Ebsen, Director
Financial Aid, Tracey Lehman, Director
Geo-Heat Center, John Lund, Director
Housing and Residence Life, Mandi Clark, Director

Human Resources and Affirmative Action, Ron McCutcheon, Director
Information Technology Services, Andy Abbott, Chief Information Officer
Institutional Research, Anji Duchi, Director
Learning and Teaching, Center for, David Westhart, Director
Library, Karen Kunz, Interim Director
OIT at Boeing, David M. Woodall, Director
Oregon Renewable Energy Center, Tom Chester, Director
Paper Owl Bookstore, Lane Hickman, Director
Portland Operations, Richard Swanson, Director of Facilities and Contracts
Public Relations, Valerie Lane, Director
Registrar’s Office, Marla Edge, Registrar
Safety, Ed Guy, Director
Small Business Development Center, Jamie Albert, Director
Pre-College Programs, Vacant, Director
Student Development, Jane Rider, Director
Student Health Center, Marilyn Gran-Moravec, Administrative Director
Tech Opportunities Program, Joan Lousalet, Director
Administration


Jamie Albert (1984), Assistant Professor, Director, Small Business Development Center. B.S. (1978), University of Wisconsin-Eau Claire; M.B.A. (1991), Southern Oregon University.


Bradley Burda (1983), Interim Dean, School of Health, Arts and Sciences; Acting Provost; and Vice President of Academic Affairs. B.S. (1972), Iowa Wesleyan College; M.A. (1982), California State University, Long Beach.


Mandi Clark (2004), Director, Housing and Residence Life. B.A. (1997), Kansas State University; M.S. (1999), University of Nebraska.


Dolores “Lita” Colligan (2007), Associate Vice President for Strategic Partnerships. B.A. (1975), University of California, Santa Cruz.

Joemae Cox (1994), Manager, Faculty Support Services, Distance Education. A.A. (1974), Iowa Lakes Community College South; B.S. (1994), Oregon Institute of Technology; M.S. (2002), Southern Oregon University.

Christopher Dalla (1989), Director, Campus Dining; Director, College Union. B.S. (1972), Cornell University; M.S. (1987), University of Pennsylvania, Philadelphia.


Barbara DeKalb (2007), Director, Distance Education. B.S. (1970), Linfield College; M.S. (1972), Washington State University.

Connie Dernbach (2000), Executive Secretary to Vice President for Student Affairs. B.A. (1981), California Lutheran College.


David Ebsen (1999), Director, Facilities Services.

Marla Edge (1983), Assistant Professor, Registrar; Director, Academic Agreement and Articulations. B.S. (1976), M.Ed. (1989), Oregon State University.

Andrea “Andi” Ehlers (2008), Administrative Coordinator, Housing and Residence Life.


Celina Foster (2003), Executive Secretary to Vice President for Finance and Administration.

Honor Christine Frazier (2008), Student Programs Coordinator, Student Development. A.A. (2006), B.S. (2008), Oregon Institute of Technology.


Tara Garlock (2008), Coordinator K-8 Programs, Sponsored and Pre-College Programs. B.S. (2006), Southern Oregon University.

Michael Garrard (2007), Coordinator, Sports Marketing/Promotion.

Alden Glidden (1978), Associate Professor, Medical Director, Student Health Center. B.S. (1965), University of Michigan, Ann Arbor; M.D. (1969), Wayne State University.


Sharon Hanson (1986), Coordinator, Media Services.

Mary Hedlund (2008), Benefits Officer, Human Resources. B.S. (2003), Oregon State University.

Marilyn Herrington (2001), Custodian Supervisor, Physical Plant.

Grant “Lane” Hickman (1997), Manager, Paper Owl Bookstore. B.S. (1992), University of Utah.


Michael Hubbard (2008), Manager, College Union. B.S. (1978), and M. Ed. (1984), Oregon State University.


Diana Kellstrom (2007), Administrative Assistant to Director of Center for Learning and Teaching.

Sandra King (1990), Payroll Supervisor, Business Office.


Anne Malinowski (1990), Office Manager, Portland Operations.


Russell McMahon (2003), Director, Athletic Development. B.A. (1973), Kansas Wesleyan University.

Cheryl Meyers (1989), Executive Secretary, Academic Affairs.

Gail Michael (2009), Purchasing Manager, Office of Business Affairs.


Bryan Mueller (2005), Men’s and Women’s Soccer Coach.


J. Samuel Murphy (1990), Assistant Professor, Coordinator, Student Success. B.A. (1973), East Carolina University; M.S. (1979), Gallaudet University; Ph.D. (1986), University of Arizona.


Deanne Pandozzi (2002), Student Programs Assistant.

Adria Paschal (2007), Executive Assistant to the President.

Wendy Pedersen (1999), Associate Registrar. B.S. (1997), Oregon State University; M.S. (2005), Southern Oregon University.


Laura Reid (2007), Coordinator, Center for Learning and Teaching. B.S. (2005), Oregon Institute of Technology.


Josh Rindfleisch (2005), Senior Location Producer. B.A. (2002), Idaho State University.


Kathleen Starkey (1999), Office Coordinator, Admissions.

Greg Stewart (2004), Head Women’s Softball Coach. B.S. (1992), Sterling College.


Alice “Diane” Tiefel (2000), Assistant Program Director, Boeing.


Jeff Wiseman (2001), Assistant Director, Bookstore.

Mary Ann Zemke (2008), Budget Officer. A.S. (1975), Lake Michigan College; B.A. (1977), Western Michigan University; M.B.A. (1990), Western Michigan University.

Instructional Faculty

This listing reflects faculty for the 2009-2010 academic year. In some cases, changes taking effect during 2010-2011 are included in the faculty list under the department descriptions.


Valerie Ball (2008), Assistant Professor, Communication. B.A. (1973), University of Oregon; M.S. (1981), University of Colorado; M.S. (2003), Portland State University.


Raymond “Jay” A. Bockelman (2003), Professor, Computer Systems Engineering Technology. B.S. (1982), Portland State University; M.S. (1992), University of Oregon.


Todd W. Breedlove (1999), Associate Professor, Computer Systems Engineering Technology. B.S. (1996), Oregon Institute of Technology; M.S. (1999), Southern Oregon University.

JaNae J. Broker (2004), Assistant Professor, Medical Imaging Technology. B.S. (2000), Oregon Institute of Technology; M.Ed. (2006), University of Phoenix. Registered Technologist (RVT, RDCTS).


Ralph A. Carestia (1990), Professor, Computer Systems Engineering Technology. B.S. (1974), University of Southern Colorado, Pueblo; M.S. (1980), San Jose State University.


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.

Burton D. Clark (1998), Professor, Natural Sciences. B.S. (1979), University of Massachusetts, Amherst; Ph.D. (1986), Ohio State University.

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.


Michael A. Cornachione (1992), Professor, Civil Engineering. B.S. (1975), University of Virginia, Charlottesville; M.S. (1992), Michigan Technological University. Registered Professional Engineer, Oregon.


Kate P. Darling (2001), Instructor, Allied Health Partnerships, Paramedic Education. A.A.S. (1997), Oregon Health & Science University; B.A. (1976), College of the Atlantic.


Heidi Denton (2008), Instructor, Dental Hygiene, ODS College of Dental Sciences. B.S. (1999), Oregon Health & Science University.


Marian S. Ewell (2001), Assistant Professor, Allied Health Partnerships, Clinical Laboratory Science. B.S. (1965), Southern Oregon University, B.S. (1968), University of Oregon. MT (ASCP), CLS (NCA) registered.


Abraham Furman (2001), Associate Professor, Allied Health Partnerships, Clinical Laboratory Science. B.S. (1970), San Diego State University; B.S. (1972), Loma Linda University; Ph.D. (1980), University of California, Los Angeles. MT (ASCP) registered.


Steven Goodstein (2001), Associate Professor, Allied Health Partnerships, Clinical Laboratory Science. B.A. (1966), San Jose State University; M.S. (1978), Portland State University. MT (ASCP) registered.


James Heath III (2007), Assistant Professor, Dental Hygiene. B.S. Northern Arizona University, D.M.D (1974), Baylor College of Medicine.

David Hedelman (2008), Assistant Professor, Humanities and Social Science. B.A. (1974), University of California Santa Barbara; M.S. (1990), Western Oregon University.
Anne V. Hiller Clark (2001), Associate Professor, Instructional Services and Shaw Historical Library. B.S. (1985), College of William and Mary; M.S. (1991), University of Delaware; M.S.L.S. (2004), Drexel University.


Richard G. Hoylman (2002), Assistant Professor, Medical Imaging Technology. B.A. (1988), Oregon Institute of Technology; M.M. (2006), Southern Oregon University; Certified Nuclear Medicine Technologist (CNMT).


Alisha Huntoon (2005), Assistant Professor, Humanities and Social Sciences. B.S. (1999), University of Wisconsin, Stevens Point; M.S. (2002), Ph.D. (2005), Washington State University.


Maria Lynn Kessler (2002), Associate Professor, Humanities and Social Sciences. B.S. (1983), Northeastern University; M.S. (1989), Southern Illinois University; Carbondale; Ph.D. (1994), Florida State University.

Grant C. Kirby (2003), Assistant Professor, Information Technology, Management Department. B.S. (1987), Oregon Institute of Technology; M.B.A. (1999), University of Oregon.


Hui Yun Li (2006), Associate 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), Associate Professor, Civil Engineering. B.S. (1989), University of Alberta; Ph.D. (2005), Portland State University. Registered Professional Engineer, Alberta.


LeAnn Maupin (1997), Associate Professor, Medical Imaging Technology. B.S. (1992), Oregon Institute of Technology; M.Ed. (2001), University of Phoenix.


Marla Miller (1999), Associate Professor, Management. B.S. (1986), Southern Oregon University; M.S. (1994), University of Portland.


Julianne M. Murray (1987), Associate Professor, Communication. B.A. (1975), Stanford University; M.A. (1979), Reed College; Ph.D. (1992), University of Oregon.


Mary “Molly” R. O’Shaughnessy (1999), Associate Professor, Natural Sciences. B.S. (1978), University of New Hampshire; D.V.M. (1992), Ohio State University.


Richard W. Pohl (1983), Professor, Humanities and Social Sciences. B.S. (1970), Iowa State University; Ph.D. (1978), University of Minnesota.


Mary D. Prange (2005), Instructor, Dental Hygiene. A.A. (1976), Cerritos College.


Andrew Ray (2008), Research Associate, Natural Sciences. B.S. (1994), Purdue University; M.S. (1999), Northern Michigan University; Ph.D. (2005), Idaho State University.


Kathleen A. Sale (1992), Associate Professor, Natural Sciences. B.S.N. (1986), Oregon Institute of Technology; M.S. (1998), Southern Oregon University.


Hong “Randy” Y. Shih (1984), Professor, Manufacturing and Mechanical Engineering and Technology. B.S. (1979), The Chung-Yuan University, Taiwan; M.S. (1984), University of Nebraska, Lincoln.

Svetla Stoilova (2008), Assistant Professor, Manufacturing and Mechanical Engineering and Technology. B.S. (1971), and Ph.D. (1986), Institute of Mechanical and Electrical Engineering, Bulgaria.

William J. Stuart (2004), Assistant Professor, Manufacturing and Mechanical Engineering and Technology. B.S. (1969), University of Nevada, Reno; M.S. (1972), University of Southampton, UK.

Wangping Sun (2005), Assistant Professor, Manufacturing and Mechanical Engineering and Technology. B.S. (1988), Northern Jiaotong University; M.S. (2002), Ph.D. (2002), Kansas State University.

Ronald H. Swisher (1976), Professor, Natural Sciences. B.A. (1972), Pomona College; Ph.D. (1976), University of Oregon.


Richard Torres (2007), Associate Professor, Natural Science. B.S. (1982), Brigham Young University; M.S. (1989), California State University, Long Beach; Ph.D. (1996), Idaho State University, Pocatello.

Terri Torres (2008), Assistant Professor, Mathematics. B.S. (1981), Brigham Young University; M.S. (1994), Idaho State University.


Valerie J. Vance (1990), Professor, Communication. A.A. (1976), Big Bend Community College; B.A. (1979), Western Washington University; M.A. (1988), New Mexico State University, Las Cruces.

Lia Vella (2008), Reference/Special Projects Library. B.A. (1992), University of Rochester; Ph.D. (2003), University at Buffalo.


Thomas White (2008), Assistant Professor, Electrical Engineering and Renewable Energy. B.A. (1976), University of California Santa Barbara; B.S. (1978), Santa Clara University; M.S. (1987), Portland State University.


Carrie R. Wittmer (2005), Assistant Professor, Natural Sciences. B.A. (1991), St. Mary's College, California; M.S. (1993), Lesley College; B.S. (2008), Oregon Institute of Technology.

Lawrence J. Wolf (1998), Professor, Manufacturing and Mechanical Engineering and Technology. A.A. (1959), Harris-Stowe State University; B.S.M.E. (1961), M.S.M.E. (1962), D.Sc. (1971), Washington University, St. Louis; Registered Professional Engineer, Oregon, Missouri; OIT President Emeritus (Designate); Distinguished Service Professor of the Oregon University System.


David Woodall (2003), Professor, Program Director, Boeing. B.S. (1967), Hendrix College; M.S. (1968), Columbia University; Ph.D. (1976), Cornell University.


Cheryl L. Zelinsky (1997), Associate Professor, Medical Imaging Technology. A.A. (1975), Ohlone College; B.A. (1991), St. Mary's College, California; M.M. (2002), Southern Oregon University; Registered Technologist (R), ARRT, CRT (R, F), Registered Diagnostic Medical Sonographer, RDMS (OB-GYN, ABD, BR).

Gary L. Zimmerman (1995), Professor, Medical Imaging Technology. B.S. (1984), Oregon Institute of Technology; M.S. (1993), University of Wisconsin, Oshkosh; Registered Technologist (R), (MR), (CT), ARRT.

 Emeritus Faculty

Marshall Ager, B.S., Assistant Professor, Civil Engineering and Geomatics, 1977-2004.


Judy Bronkey, M.A., Associate Professor, Director, Ethnic and International Student Services, 1969-1995.


Ross Carroll, Ph.D., Professor of Communication, 1984-2003.

Thomas J. Connors, Ph.D., Professor and Vascular Technology Program Director, 1969-1999.

Jesse Crabtree, Assistant Professor, Civil Engineering Technology, 1947-1976.

G. Gene Culver, B.S., Associate Professor, Associate Director, Geo-Heat Center, 1988-1995.

W.M. Douglass, M.Ed., Professor and Dean of Administration, 1954-1983.


David Dyrud, Ph.D., Professor of Communication, 1975-2003.


Jeanne Ford, R.N., Assistant Professor, Administrative Director, Student Health Service, 1964-1983.


Polly Francis, M.S., Professor, Mathematics, 1990-2009.


Charles C. Glover, B.S., Associate Professor, Diesel Power Technology, 1966-1990.


Richard M. Moore, Ph.D., Professor and Director, Portland Operations, 1972-1997.


Gary J. Naseth, Ph.D., Professor, Humanities and Social Sciences, 1975-2009.

JoAnne M. Ogborn, M.S., Professor, Director, Extended Studies and Summer Session, 1968-1996.


Ralph L. Pettit, M.S., Professor, Humanities and Social Sciences, 1969-1986.


Margaret E. Reid, M.S., Associate Professor, Nursing, 1981-1997.


Mata A. Rust, M.S., Professor, Communication Department, 1972-1999.

Joseph E. Sarsenski, Ph.D., Professor, Civil Engineering, 1998-2008.

Andrew J. Sedlock, M.S., Professor, Electrical Engineering and Renewable Energy, 1988-2008

Edward Silling, Ph.D., Professor, Communication Department, 1975-2003.


Donald R. Skudstad, Ph.D., Professor, Manufacturing and Mechanical Engineering and Technology, 1976-1996.


Pauline Stuedli, Assistant Professor, Dental Hygiene, 1977-1999.


Larsen S. Svanevik, Ph.D., Professor, Natural Sciences, 1966-1997.


David J. Vargas, M.S.C.E., Associate Professor, Civil Engineering Technology, 1985-1997.


David C. Warner, Ph.D., Professor, Natural Sciences, 1984-2002.

Gary E. Wehr, M.A., Professor, Department Chair, General Studies, 1969-1996.


Raenelle J. Zumbo, M.S., Assistant Professor, Communication, 1976-2008.
Emeritus Administration

Mary J. Bradford, M.S., Aquatics Director/Softball Coach, 1975-2004

Paula Cloud, Executive Secretary to the President, 1997-2008.

Nancy K. Cox, Executive Secretary to the President, 1961-1999.


Martha Anne Dow, Ph.D., President, 1992-2007.

Christian H. Eismann, Ph.D., Professor and Dean of Academic Affairs, 1986-1996.


April C. Leifeste, A.A., Executive Secretary, Academic Affairs, 1972-2006

Paul Lienau, M.S., Professor and Director of the Geo-Heat Center, 1968-1997.


Robert Thompson, B.S., Sports Information Director, Athletics, 1993-2007

Gary L. Willhide, M.S., Director, Public Affairs, 1988-2005


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