OAKLAND UNIVERSITY

Volume 3

School of Health Sciences (SHS)
School of Business Administration (SBA)
School of Education and Human Services (SEHS)
School of Engineering and Computer Science (SECS)
School of Nursing (SON)

2022-2023

UNDERGRADUATE CATALOG

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The academic requirements described in this catalog are in effect fall semester 2022 through summer semester 2029. Undergraduate students admitted to a degree-granting program may use provisions in this catalog to meet requirements within that time frame.

School of Health Sciences

The School of Health Sciences provides an exceptional environment of collaborative, academic and clinical learning that helps transform students into leaders impacting the health needs of our communities in diverse wellness and health-related practices.

The School of Health Sciences is passionate about providing students with the best science-based health education, high-quality academic preparation, interdisciplinary teaching and excellence in instruction in the classroom and clinical laboratory.

School Honors

Honors are awarded to School of Health Sciences graduating students who have earned a GPA of 3.50 or above in courses completed in the School.

Admission Requirements

Our programs with additional admissions requirements may be considered on a competitive basis if the balance between applicants and available instructional resources requires such action to maintain the academic integrity of the program.

Clinical and Diagnostic Sciences, B.S.

Clinical and Diagnostic Sciences provides an experiential human-based education in biomedical, imaging, and clinical sciences, and is built upon the foundations of biology and chemistry. The Bachelor of Science in Clinical and Diagnostic Sciences degree program offers specializations in Medical Laboratory Science, Histotechnology, Radiologic Technology, Nuclear Medicine Technology, Pre-clinical Professions, Pre-pharmacy Sciences, and Pre-Physician Assistant. Using clinical perspectives to develop critical thinking, teamwork, and communication skills, students are prepared for a variety of health careers or the pursuit of advanced graduate education (M.D., D.O., PA, Pharm.D., DDS, DVM, etc.).

Students pursuing a Clinical and Diagnostic Sciences (CDS) degree are required to complete a minimum of 120 credits and fulfill the requirements described below.

Requirements for clinical and diagnostic sciences, B.S.

1. General Education requirements

In order to graduate on-schedule without taking additional courses, it is highly recommended that students meet with an Undergraduate Academic Adviser concerning the selection of all of their general education courses.

Each candidate for an Oakland University baccalaureate will need to satisfactorily complete approved courses in each of the following areas: Foundation, Exploration, Integration, Writing, U.S. Diversity and Capstone. For details, refer to the General Education Requirements section of the catalog.

2. Complete the CDS core curriculum

3. Complete the specialization course requirements specified under one of the following specializations:

Histotechnology; Medical Laboratory Science; Nuclear Medicine Technology; Radiologic Technology; Pre-Clinical Professions; Pre-Physician Assistant; or Pre-Pharmacy

4. Complete all CDS major program course-work with a cumulative GPA of 2.80 or higher

Clinical and Diagnostic Sciences core curriculum courses

- BIO 1200 - Biology I (4)
- BIO 2100 - Human Anatomy (4)
- BIO 2101 - Human Anatomy Laboratory (1)
- BIO 2600 - Human Physiology (4)
- CDS 2010 - Careers in Clinical and Diagnostic Sciences (1)
- CDS 2100 - Medical Terminology (1)
- CDS 2260 - Introduction to Laboratory Theory and Techniques (2) (not required for Pre-Physician Assistant, RAD or NMT specialization)
- CDS 2070 - Health Care Systems Around the World (3)
- HS 4500 - Ethics in Health Care (4)
- STA 2220 - Introduction to Statistical Concepts and Reasoning (4) or STA 2222 - Statistical Methods for Biology (4) or STA 2226 - Applied Probability and Statistics (4)

Clinical and Diagnostic Sciences, B.S., Specialization in Histotechnology

Histotechnologists perform a variety of diagnostic and research procedures in the anatomic sciences. During the clinical internship, students learn histological techniques that involve processing, sectioning and staining of tissue specimens that have been removed from humans or animals by biopsy, surgical procedures or autopsy. Advanced techniques include muscle enzyme histochemistry, electron microscopy, immunofluorescence and immunoenzyme procedures, molecular pathology techniques including hybridization and image analysis, and medical photography. Students may apply for specialization standing in histotechnology after completing the CDS core curriculum and acceptance to a hospital internship. Application to the hospital-based internship is typically made during the winter semester of the sophomore year. The junior year consists of the prescribed professional course requirements at Oakland University. The senior year consists of a 12-month internship at the Beaumont Health School of Histotechnology. Acceptance into the internship program is competitive and based on grade point average, personal interview and letters of recommendation.

Admission to clinical specialization internship

To be accepted in a clinical specialization internship, students must submit a formal application for each program for which they seek consideration. Applications for the histotechnology internship program is processed in the winter semester of the sophomore year (or winter semester following completion of the Clinical and Diagnostic Sciences core curriculum). It is recommended that students have at least a 3.00 overall GPA. Students with lower grade point averages may be admitted provisionally pending satisfactory completion of appropriate fall semester, junior-year course work. Students should check the clinical program's website for exact application dates.

Grade point policy

Students in the Histotechnology professional specialization whose cumulative grade point average falls below a 2.80 are not able to graduate with the professional specialization designation. In these cases, students are eligible to graduate with a Clinical and Diagnostic Sciences Pre-clinical professions specialization.

In order to remove program probationary status, students must raise their cumulative major grade point average to 2.80 or higher.

Histotechnology specialization professional course requirements

Students pursuing a specialization in histotechnology must complete the degree requirements for the major in Clinical and Diagnostic Sciences, B.S. and take the following courses for the specialization

- BIO 3140 - Histology (4)
- BIO 3141 - Histology Laboratory (1)
- CDS 4000 - Medical Genetics (4)
- CDS 4010 - Human Pathology (4)
- CDS 4020 - Molecular Diagnostics (3)
- CDS 4140 - Hematology/Hemostasis I (3)
- CDS 4230 - Medical Immunology (3)
- CDS 4250 - Medical Biochemistry (4)
- CDS 4300 - Clinical Microbiology (4)
- CDS 4350 - Clinical Parasitology, Mycology, Virology (3)
- CHM 1440 - General Chemistry I (4)
- CHM 1450 - General Chemistry II (4)
- CHM 1470 - General Chemistry Laboratory I (1)
- CHM 1480 - General Chemistry Laboratory II (1)
- HT 4010 - Basic Histotechnique and Histochemical Staining Methods (12)

- HT 4020 - Basic Electron Microscopy (3)
- HT 4030 - Immunohisto-Cytochemistry (5)
- HT 4040 - Special Techniques (4)

Clinical and Diagnostic Sciences, B.S., Specialization in Medical Laboratory Science (MLS)

Medical Laboratory Scientists perform diagnostic tests that provide important information to determine the presence, extent, or absence of disease as well as data to evaluate the effectiveness of treatment. They work with all types of body tissues and fluids, from blood and urine to cell samples. Major areas of specialization within the laboratory include hematology, clinical chemistry, microbiology, serology, urinalysis, immunohematology (blood bank) and molecular diagnostics.

Students may apply for specialization standing in MLS after completing the CDS core curriculum, generally at the end of the sophomore year. The junior and senior years consist of the prescribed professional course requirements at Oakland University. A clinical internship is required for national certification as a medical laboratory scientist (certification required for most hospital and private laboratory employment positions). Oakland University is affiliated with the following accredited MLS clinical programs: Detroit Medical Center University Laboratories; Ascension St. John Hospital; and Beaumont Health.

Admission to clinical specialization internship

To be accepted in a clinical specialization internship, students must submit a formal application for each program for which they seek consideration. Applications for the MLS internships are processed during the summer prior to the senior year. Internships are between six and ten months in length (depending on the clinical site), and are done post-graduate. It is recommended that students have at least a 3.00 overall GPA. Students with lower grade point averages may be admitted provisionally pending satisfactory completion of appropriate fall semester, junior-year course work. Students should check the clinical program's website for specific application dates. Acceptance into the internship program is competitive and based on grade point average, personal interview, and letters of recommendation.

Grade point policy

Students in the professional medical laboratory science specialization whose cumulative grade point average falls below a 2.80 are not able to graduate with the professional specialization designation. In these cases, students are eligible to graduate with a Clinical and Diagnostic Sciences Pre-clinical professions specialization.

In order to remove program probationary status, students must raise their cumulative major grade point average to 2.80 or higher.

Medical laboratory science specialization professional course requirements

Students pursuing a specialization in medical laboratory science must complete the degree requirements for the major in Clinical and Diagnostic Sciences, B.S. and take the following courses for the specialization:

- PHY 1080 - Principles of Physics I (4)
- PHY 1090 - Principles of Physics II (4)
- CDS 4000 - Medical Genetics (4)
- CDS 4020 - Molecular Diagnostics (3)
- CDS 4140 - Hematology/Hemostasis I (3)
- CDS 4150 - Hematology/Hemostasis Laboratory I (1)
- CDS 4160 - Hematology/Hemostasis II (4)
- CDS 4170 - Hematology/Hemostasis Laboratory II (1)
- CDS 4230 - Medical Immunology (3)
- CDS 4240 - Immunohematology (3)
- CDS 4241 - Immunohematology Laboratory (1)
- CDS 4250 - Medical Biochemistry (4)
- CDS 4270 - Clinical Chemistry (4)
- CDS 4280 - Clinical Chemistry Laboratory (1)
- CDS 4300 - Clinical Microbiology (4)
- CDS 4310 - Clinical Microbiology Laboratory (1)
- CDS 4350 - Clinical Parasitology, Mycology, Virology (3)
- CDS 4360 - Clinical Parasitology, Mycology, Virology Lab (1)
- CDS 4400 - Clinical Correlations (3)
- CHM 1440 - General Chemistry I (4)
- CHM 1450 - General Chemistry II (4)
- CHM 1470 - General Chemistry Laboratory I (1)
- CHM 1480 - General Chemistry Laboratory II (1)
- CHM 2340 - Organic Chemistry I (4)

Note

Some clinical programs may require MTH 1441. Check the individual clinical programs for current requirements.

Clinical and Diagnostic Sciences, B.S., Specialization in Nuclear Medicine Technology

Nuclear Medicine Technologists utilize small amounts of radioactive materials for diagnosis, therapy and research. Diagnosis can involve organ imaging using gamma counters to detect radioactive material administered to the patient or analysis of biologic specimens to detect levels of various substances. Therapeutic doses of radioactive materials are also given to patients to treat specific diseases.

Admission

The Nuclear Medicine Technology (NMT) specialization is available to School of Health Sciences students through a partnership between the Department of Clinical and Diagnostic Sciences, and the Nuclear Medicine Institute at the University of Findlay (Findlay, Ohio). Admission to the University of Findlay Nuclear Medicine Technology program is through a competitive admissions process. Once accepted, Oakland students will need to: 1) apply to be a guest student at the University of Findlay while they are in the Nuclear Medicine program; 2) send a letter of acceptance to their academic adviser; and 3) register for classes and pay tuition through the University of Findlay.

The Findlay program has two start dates per year, in August and January. Application for the clinical program is made during the junior year and should be made 9-12 months prior to the desired beginning class date (November 1st for an August start date or April 1st for the following January start date). The senior year of study consists of a 12-month program, one semester on the University of Findlay campus, and two semesters of full-time clinical education at a clinical affiliate. Currently available clinical affiliates in the Detroit metropolitan area include Children's Hospital of Michigan, Detroit; Harper Hospital, Detroit; University of Michigan Health System, Ann Arbor; and the Veterans Affairs Ann Arbor Healthcare System, Ann Arbor. The Findlay NMT program has over 60 clinical affiliates, in 10 states, so additional options are available if the student so desires. Upon completion of the NMT program at the University of Findlay, the student will receive their B.S. in Clinical and Diagnostic Sciences, Specialization in NMT, from Oakland University. Students are responsible for sending their final, official transcripts from Findlay University to the records office at Oakland University at the end of their final semester in order to confer the degree. Acceptance into the University of Findlay Nuclear Medicine Technology program is competitive and based on grade point average, personal interview and letters of recommendation.

Grade point policy

Students in the nuclear medicine technology specialization whose cumulative grade point average falls below a 2.80 are not able to graduate with the professional specialization designation. In these cases, students are eligible to graduate with a Clinical and Diagnostic Sciences Pre-clinical professions specialization.

In order to remove program probationary status, students must raise their cumulative major grade point average to 2.80 or higher.

Nuclear Medicine Technology Specialization professional course requirements

Students pursuing a specialization in nuclear medicine technology must complete the degree requirements for the major in Clinical and Diagnostic Sciences, B.S. and take the following courses for the specialization.

- COM 2000 - Public Speaking (4)
- CDS 4010 - Human Pathology (4)
- CHM 1440 - General Chemistry I (4)
- CHM 1470 - General Chemistry Laboratory I (1)
- MTH 1441 - Precalculus (4)
- PHY 1080 - Principles of Physics I (4)

Degree completion at the Nuclear Medicine Institute, University of Findlay, OH

To complete the nuclear medicine technology specialization, students must complete the following courses at the University of Findlay

- NMED 406 Molecular Imaging Mathematics (3)
- NMED 416 Molecular Imaging Physics (2)
- NMED 425 Molecular Imaging Radiobiology (1)
- NMED 435 Molecular Imaging Radiation Protection (2)
- NMED 445 Molecular Non-Imaging Procedures (3)
- NMED 455 Molecular Imaging Procedures (5)
- NMED 462 Radionuclide Therapies (1)
- NMED 465 Radiochemistry and Radiopharmaceuticals (3)
- NMED 472 Molecular Imaging Instrumentation (3)
- NMED 475 Molecular Imaging Spect (1)
- NMED 477 Molecular Imaging Pet (1)
- NMED 485 Clinical Nuclear Medicine I (12)
- NMED 486 Clinical Nuclear Medicine II (12)
- NMED 487 Molecular Imaging Capstone (1)

Clinical and Diagnostic Sciences, B.S., Specialization in Pre-clinical professions for medicine, dentistry, optometry, and veterinary medicine

The Bachelor of Science degree in Clinical and Diagnostic Sciences (CDS) provides excellent preparation for admission to a variety of professional schools. For a student desiring greater flexibility in planning their academic program, the Pre-Professional Specialization professions specialization may be of interest. Students should consult with the CDS adviser as to the academic option most suitable for the individual student's academic career goals.

Pre-Clinical Professions Specialization course requirements

Students pursuing a specialization in pre-clinical professions must complete the degree requirements for the major in Clinical and Diagnostic Sciences, B.S. and take the following courses for the specialization:

- PHY 1010 - General Physics I (4) and PHY 1100 - General Physics Lab I (1)
- PHY 1020 - General Physics II (4) and PHY 1110 - General Physics Lab II (1)
- CHM 1440 - General Chemistry I (4)
- CHM 1450 - General Chemistry II (4)
- CHM 1470 - General Chemistry Laboratory I (1)
- CHM 1480 - General Chemistry Laboratory II (1)
- CHM 2340 - Organic Chemistry I (4)
- CHM 2350 - Organic Chemistry II (4)
- CHM 2370 - Organic Chemistry Laboratory (2)
- CDS 4000 - Medical Genetics (4)
- CDS 4050 - Pharmacology (3)
- CDS 4140 - Hematology/Hemostasis I (3)
- CDS 4230 - Medical Immunology (3)
- CDS 4250 - Medical Biochemistry (4)
- CDS 4300 - Clinical Microbiology (4)
- CDS 4310 - Clinical Microbiology Laboratory (1) or CDS 4320 - Medical Microbiology Laboratory (1)

And electives (14 credits) from the following courses:

- BIO 1300 - Biology II (4)
- BIO 3140 - Histology (4) and BIO 3141 - Histology Laboratory (1)
- BIO 3620 - Medical Physiology (4)
- BIO 4100 - Advanced Visceral Human Anatomy (4)
- BIO 4112 - Advanced Musculoskeletal Human Anatomy (4)
- BIO 4620 - Advanced Human Physiology (4)
- BIO 4622 - Endocrinology (4)
- CDS 4010 - Human Pathology (4)
- CDS 4020 - Molecular Diagnostics (3)
- CDS 4150 - Hematology/Hemostasis Laboratory I (1)
- CDS 4160 - Hematology/Hemostasis II (4)
- CDS 4170 - Hematology/Hemostasis Laboratory II (1)
- CDS 4270 - Clinical Chemistry (4) and CDS 4280 - Clinical Chemistry Laboratory (1)
- CDS 4350 - Clinical Parasitology, Mycology, Virology (3) and CDS 4360 - Clinical Parasitology, Mycology, Virology Lab (1)
- CDS 4400 - Clinical Correlations (3)
- CDS 4929 - Directed Readings (1 TO 3)
- CDS 4995 - Directed Research (1 TO 4)
- EHS 1100 - Healthy Workplace: Protecting People and the Environment (3)
- EHS 4450 - Ergonomics (3)
- EXS 3010 - Exercise Physiology (3)
- EXS 3015 - Exercise Physiology Laboratory (1)
- MTH 1441 - Precalculus (4)
- MTH 1554 - Calculus I (4)
- NTR 2500 - Human Nutrition and Health (3)
- NTR 4100 - Nutrition and Lifecycles (4)
- PH 3000 - Introduction to Public Health (3)
- PSY 2250 - Introduction to Life-Span Developmental Psychology (4)

- SW 3101 - Human Behavior and Social Environment (4) /SW 3201 - Human Behavior and Social Environment (4)
- WHP 3250 - Issues in Women's Health (4)
- WRT 1050 - Composition I (4)
- or additional electives as approved

Clinical and Diagnostic Sciences, B.S., Specialization in Pre-Pharmacy

Within the Department of Clinical and Diagnostic Sciences, students may choose to pursue a Bachelor of Science in Clinical and Diagnostic Sciences degree with a specialization in Pre-pharmacy Sciences. This specialization prepares students to meet the academic prerequisites necessary to be considered for admission to Doctor of Pharmacy (PharmD) programs.

Through coursework, labs and experiential learning opportunities, students will develop skills to prepare and dispense prescriptions, ensure medicines and doses are correct, prevent harmful drug interactions, and counsel patients on the safe and appropriate use of their medications. Pharmacists are medication experts who enhance patient care and promote wellness.

Admission

Students pursuing a Bachelor of Science with a major in Clinical and Diagnostic Sciences (CDS) at Oakland University with a pre-pharmacy specialization may pursue admission to any accredited Doctor of Pharmacy program. Students admitted to an accredited PharmD program must complete their final year of undergraduate coursework at that program and credits earned from courses must be transferred back to Oakland University to complete the requirements for the Bachelor of Science with a major in CDS Clinical and Diagnostic Sciences. It is highly recommended that students consult with the academic adviser prior to enrolling in any of these classes, as completion of coursework does not guarantee admission or completion of the program. Admission to a PharmD program is through a competitive admissions process. Once accepted, Oakland University students will need to: 1) send a letter of acceptance to their academic adviser; and 2) register for classes and pay tuition through the PharmD school; and 3) send official transcripts after the first year (fall/winter semesters) of the PharmD program to Oakland University.

Students not accepted into a PharmD program may complete the degree program outlined below for a Bachelor of Science with a major in CDS Clinical and Diagnostic Sciences.

Pre-Pharmacy specialization professional course requirements

Students pursuing the pre-pharmacy specialization must complete the degree requirements for the major in Clinical and Diagnostic Sciences, B.S. and take the following courses for the specialization:

- CDS 3300 - Microbiology of Infectious Diseases (3)

- CDS 3310 - Microbiology of Infectious Diseases Laboratory (1)
- CDS 4000 - Medical Genetics (4)
- CDS 4050 - Pharmacology (3)
- CDS 4140 - Hematology/Hemostasis I (3)
- CDS 4150 - Hematology/Hemostasis Laboratory I (1)
- CDS 4160 - Hematology/Hemostasis II (4)
- CDS 4170 - Hematology/Hemostasis Laboratory II (1)
- CDS 4230 - Medical Immunology (3)
- CDS 4240 - Immunohematology (3)
- CDS 4241 - Immunohematology Laboratory (1)
- CDS 4250 - Medical Biochemistry (4)
- CHM 1440 - General Chemistry I (4)
- CHM 1450 - General Chemistry II (4)
- CHM 1470 - General Chemistry Laboratory I (1)
- CHM 1480 - General Chemistry Laboratory II (1)
- CHM 2340 - Organic Chemistry I (4)
- CHM 2350 - Organic Chemistry II (4)
- CHM 2370 - Organic Chemistry Laboratory (2)
- MGT 1100 - Contemporary World Business (4)
- MTH 1554 - Calculus I (4)
- PHY 1010 - General Physics I (4)
- PHY 1100 - General Physics Lab I (1)
- PharmD coursework minimum of 13 credits transferred to Oakland University

Specialization in Pre-Pharmacy (3+1) Manchester University

Students pursuing a Bachelor of Science with a major in Clinical and Diagnostic Sciences (CDS) at Oakland University with a pre-pharmacy specialization may pursue admission to the Doctor of Pharmacy (Pharm D) at Manchester University.

Manchester University will reserve two (2) seats in each annual cohort of students entering its Doctor of Pharmacy program for qualified students of Oakland University. These students would also qualify for a

reserved seat in the Dual Degree PharmD/MS in Pharmacogenomics (PGX) cohort for that entry year. Qualified students must complete the application process for admission to the Manchester Pharmacy program according to the established deadlines.

Specialization in Pre-Pharmacy (3+1) Roosevelt University

Roosevelt University, located just outside of Chicago, has partnered with Oakland University to create an educational pathway for qualified students interested in becoming pharmacists. Beginning the fall of 2022, Oakland University students can complete three years in the School of Health Sciences and enter Roosevelt University's Doctor of Pharmacy program to simultaneously complete their Bachelor of Science at Oakland University and start a PharmD. Benefits of this program include:

- Direct application to Roosevelt University rather than through PharmCAS
- Upon completion of prerequisite coursework student will be eligible to apply for the program
- Waiver of PCAT requirements

The Roosevelt University affiliation is in addition to our previously established Manchester University Doctor of Pharmacy program.

Pre-Pharmacy (3+1) specialization professional course requirements

Students pursuing the pre-pharmacy (3+1) specialization must complete the degree requirements for the major in Clinical and Diagnostic Sciences, B.S. and take the following courses for the specialization:

- CDS 3300 - Microbiology of Infectious Diseases (3)
- CDS 3310 - Microbiology of Infectious Diseases Laboratory (1)
- CDS 4000 - Medical Genetics (4)
- CDS 4050 - Pharmacology (3)
- CDS 4250 - Medical Biochemistry (4)
- CHM 1440 - General Chemistry I (4)
- CHM 1450 - General Chemistry II (4)
- CHM 1470 - General Chemistry Laboratory I (1)
- CHM 1480 - General Chemistry Laboratory II (1)
- CHM 2340 - Organic Chemistry I (4)
- CHM 2350 - Organic Chemistry II (4)
- CHM 2370 - Organic Chemistry Laboratory (2)
- MGT 1100 - Contemporary World Business (4)
- MTH 1554 - Calculus I (4)
- PHY 1010 - General Physics I (4)

- PHY 1100 - General Physics Lab I (1)
- PharmD coursework minimum of 13 credits transferred to Oakland University

Clinical and Diagnostic Sciences, B.S., Specialization in Pre-Physician Assistant

Physician Assistant (PA) practitioners serve a critical role in the delivery of healthcare in the public and private sectors. PAs perform many of the patient care tasks traditionally performed by physicians in diverse practices from family medicine to surgery and orthopedics. They perform complete medical exams, prescribe medications, and counsel patients on health and wellness.

The Pre-Physician Assistant (Pre-PA) specialization in Clinical and Diagnostic Sciences (CDS) allows students to complete the prerequisite classes for entry into most PA programs. Students may enter the Pre-PA program in their freshman year, or transfer into the program from other majors or institutions. There is no application to enter the program. Students must complete four one-credit courses in the Pre-PA curriculum designed to prepare the student for the PA application and field of study. More than one course may be taken concurrently for students transferring into the specialization.

Pre-Physician Assistant specialization professional course requirements

Students pursuing the pre-physician assistant specialization must complete the degree requirements for the major in Clinical and Diagnostic Sciences, B.S. and take the following courses for the specialization:

- BIO 1201 - Biology Laboratory (1)
- CHM 1440 - General Chemistry I (4) *
- CHM 1450 - General Chemistry II (4)
- CHM 1470 - General Chemistry Laboratory I (1)
- CHM 1480 - General Chemistry Laboratory II (1)
- CHM 2340 - Organic Chemistry I (4)
- CDS 2020 - Pre-Physician Assistant Foundations (1)
- CDS 2021 - Practical Applications for the Pre-Physician Assistant (1)
- CDS 2022 - The Pre-Physician Assistant Professional (1)
- CDS 2023 - Pre-Physician Assistant Professionalism Seminar (1)
- CDS 3300 - Microbiology of Infectious Diseases (3) and CDS 3310 - Microbiology of Infectious Diseases Laboratory (1)
- CDS 4000 - Medical Genetics (4)

- CDS 4010 - Human Pathology (4)
- CDS 4050 - Pharmacology (3)
- CDS 4230 - Medical Immunology (3)
- CDS 4250 - Medical Biochemistry (4)
- HS 2000 - Introduction to Health and Health Behaviors (3)
- MGT 1100 - Contemporary World Business (4) *
- NTR 2500 - Human Nutrition and Health (3)
- PHY 1010 - General Physics I (4) * and PHY 1100 - General Physics Lab I (1)
- PSY 1000 - Introduction to Psychology (4) *
- PSY 2250 - Introduction to Life-Span Developmental Psychology (4) *
- WHP 3700 - Culture, Ethnicity and Well-being (3)
- WRT 1060 - Composition II (4)
- and eight (8) credits of CDS electives

Recommended CDS Electives (Senior year):

- CDS 4020 - Molecular Diagnostics (3)
- CDS 4140 - Hematology/Hemostasis I (3)
- CDS 4150 - Hematology/Hemostasis Laboratory I (1)
- CDS 4270 - Clinical Chemistry (4)
- CDS 4280 - Clinical Chemistry Laboratory (1)
- CDS 4995 - Directed Research (1 TO 4)
- CDS 4996 - Independent Study (1 TO 3)
- PH 3000 - Introduction to Public Health (3)
- PH 4650 - Social Determinants of Health (4)

Note

Note that several required courses satisfy general education requirements. See courses marked with "*"

Clinical and Diagnostic Sciences, B.S., Specialization in Radiologic Technology

A Radiologic (X-ray) Technologist is a professional responsible for the administration of ionizing radiation for diagnostic or research purposes. The radiologic technologist must integrate complex knowledge and advanced technical skills in the imaging of internal structures. Radiologic technologists apply knowledge of anatomy, physiology, positioning and radiographic technique in the performance of their duties.

Individuals interested in a radiography career must be able to communicate effectively with patients and other health care professionals. The radiologic technologist must display compassion, competence and concern in order to meet the special needs of the patient. Direct contact is required when maneuvering the patient into position for various procedures. Radiography is a rewarding career that combines patient care with modern medical technology.

Admission to clinical specialization internship

To be accepted in a clinical specialization internship, students must submit a formal application. Application for the radiologic technology internship program is processed in the winter semester of the sophomore year (or winter semester following completion of the Clinical and Diagnostic Sciences core curriculum) prior to the August start date of each year. Acceptance into the program is competitive and based on the prerequisite math and science grade point average, personal interview, entrance exam score, and letters of recommendation. Applicants are required to have current CPR ("Healthcare Provider") certification through the American Heart Association. Patient contact experience, volunteering with patients and advanced course work are considered favorably in the admissions process. The didactic course work is completed at Oakland University and the supervised clinical experience in the Radiologic Technology Departments at various Beaumont Health locations.

It is recommended that students have at least a 3.00 overall GPA. Students with lower grade point averages may be admitted provisionally pending satisfactory completion of appropriate fall semester, junior-year course work. Students should check the clinical program's website for exact application dates.

Grade point policy

Students in the radiologic technology specialization whose cumulative grade point average falls below a 2.80 are not able to graduate with the professional specialization designation. In these cases, students are eligible to graduate with a Clinical and Diagnostic Sciences Pre-clinical professions specialization.

In order to remove program probationary status, students must raise their cumulative major grade point average to 2.80 or higher.

Radiologic technology specialization professional course requirements

Students pursuing the radiologic technology specialization must complete the degree requirements for the major in Clinical and Diagnostic Sciences, B.S. and take the following courses for the specialization:

- PHY 1080 - Principles of Physics I (4)
- PHY 1090 - Principles of Physics II (4)
- RAD 3110 - Methods of Patient Care I (2)
- RAD 3310 - Radiologic Physics I (3)

- RAD 3330 - Principles of Radiographic Exposure I (3)
- RAD 3340 - Principles of Radiographic Exposure II (2)
- RAD 3410 - Radiographic Procedures I (4)
- RAD 3420 - Radiographic Procedures II (2)
- RAD 3430 - Radiographic Procedures III (2)
- RAD 3450 - Radiographic Image Evaluation I (2)
- RAD 4070 - Radiation Biology and Protection (2)
- RAD 4110 - Methods of Patient Care II (1)
- RAD 4310 - Radiologic Physics II (3)
- RAD 4330 - Principles of Radiographic Exposure III (2)
- RAD 4340 - Principles of Radiographic Exposure IV (3)
- RAD 4410 - Radiographic Procedures IV (3)
- RAD 4420 - Radiographic Procedures V (3)
- RAD 4440 - Medical Imaging Practices (4)
- RAD 4970 - Senior Seminar (2)
- RAD 4960 - Clinical Practicum I (3)
- RAD 4961 - Clinical Practicum II (3)
- RAD 4962 - Clinical Practicum III (3)
- RAD 4963 - Clinical Practicum IV (3)
- RAD 4964 - Clinical Practicum V (3)
- RAD 4965 - Clinical Practicum VI (3)

Advanced Modalities for Radiologic Technologists

Professionals who are currently American Registry of Radiologic Technologists (ARRT) registered may expand on their existing knowledge in the areas of Computed Tomography (CT), Magnetic Resonance Imaging (MRI), and Mammography, in affiliation with Beaumont Health. Each course is approximately one semester (15 - 17 weeks) in length and includes three to four days of clinical and one three-hour class day per week. Clinical hours take place on days and afternoon shifts at various Beaumont Health locations. Other clinical sites, locations and hours of attendance may be required. Clinical shifts vary based on the clinical rotation schedule, as assigned. With permission, additional clinical time may be allowed. Didactic coursework may be offered online. These advanced modality courses demand a high level of student professionalism, personal commitment, and academic focus.

Students may apply for admission to one of the modality courses listed below, through the Radiologic Technology program application process. Applicants are required to hold current ARRT registration or become registered with the ARRT within two weeks after the modality course start date and they must also hold current CPR ("Healthcare Provider") certification through the American Heart Association. Applications are accepted year round and the courses may be scheduled any semester based on the number of applicants. Acceptance into a modality course is based on previous math and science grade point average, personal interview, and letters of recommendation.

Modality Courses in Computed Tomography (CT), Magnetic Resonance Imaging (MRI), and Mammography

- RAD 4801 - Computed Tomography (6)
- RAD 4803 - Magnetic Resonance Imaging (7)
- RAD 4804 - Mammography (6)

Exercise Science, B.S.

The Bachelor of Science in Exercise Science explores the interrelationships among lifestyle, physical activity and health, and the science of improving human performance.

Opportunities exist for students to establish personal programs of exercise, weight control, nutrition, stress management and substance abuse avoidance. Disease prevention and quality of life are components of many of the course offerings. Selecting courses in exercise science can be especially meaningful to students entering a health-related career, with the current emphasis placed on health promotion and disease prevention within the health care delivery system.

The exercise science major allows students opportunities for practicum, research, and laboratory experiences. The major prepares graduates for positions in the field and for competitive graduate degree programs.

Requirements for the B.S. degree with a major in Exercise Science

Students pursuing a degree in Exercise Science must complete a minimum of 123 credits, including the following requirements.

1. General Education requirements

In order to graduate on-schedule without taking additional courses, it is highly recommended that students meet with an Undergraduate Academic Adviser concerning the selection of all of their general education courses.

Each candidate for an Oakland University baccalaureate will need to satisfactorily complete approved courses in each of the following areas: Foundation, Exploration, Integration, Writing, U.S. Diversity and Capstone. For details, refer to the General Education Requirements section of the catalog.

2. Complete the exercise science core courses

3. Complete the pre-physical therapy academic concentration, Orthotist and Prosthetist Assistant Studies Specialization or electives to meet a minimum of 123 credits. Students are encouraged to complete a minor to contribute to the elective requirements.

Exercise Science Core Curriculum:

- BIO 1200 - Biology I (4)
- BIO 2100 - Human Anatomy (4)
- BIO 2101 - Human Anatomy Laboratory (1) or BIO 3621 - Physiology Laboratory (1)
- BIO 2600 - Human Physiology (4)
- CHM 1440 - General Chemistry I (4) * and CHM 1470 - General Chemistry Laboratory I (1)
- EXS 1000 - Exercise (Strength Training) and Health Enhancement (2) or EXS 1100 - Cardiovascular Fitness Training (2)
- EXS 2200 - Introduction to Exercise Science (2)
- EXS 2410 - Nutrition for Exercise, Sport and Health (3) or NTR 2500 - Human Nutrition and Health (3) and NTR 3200 - Nutrition and Physical Activity (2)
- EXS 2700 - Safety and First Aid in Exercise Settings (2)
- EXS 3010 - Exercise Physiology (3)
- EXS 3020 - Biomechanics (3)
- EXS 3030 - Motor Control (3)
- EXS 4030 - Assessment and Interventions Laboratory (3)
- EXS 4715 - Integrated Laboratory in Exercise Science (3) *
- EXS 4960 - Practicum in Exercise Science (3) or EXS 4995 - Directed Research (3)
- HS 2000 - Introduction to Health and Health Behaviors (3) *
- MTH 1441 - Precalculus (4) or MTH 1554 - Calculus I (4) or MTH 1331 - College Algebra (4) and MTH 1332 - Trigonometry (3)
- PHY 1010 - General Physics I (4) * or PHY 1510 - Introductory Physics I (4)
- PHY 1100 - General Physics Lab I (1)
- PSY 1000 - Introduction to Psychology (4)
- PSY 2500 - Research Design in Psychology (4)
- STA 2220 - Introduction to Statistical Concepts and Reasoning (4) *
- Electives in exercise science to total 4 credits (may include specialization in orthotist and prothetist assistant studies courses; suggested courses EXS 2510, EXS 2520, EXS 3520)

Electives

- EXS 1000 - Exercise (Strength Training) and Health Enhancement (2)
- EXS 1100 - Cardiovascular Fitness Training (2)
- EXS 1500 - Exercise (Judo) and Health Enhancement (2)
- EXS 2000 - Group Exercise Instruction I (2)
- EXS 2100 - Group Exercise Instruction II (2)
- EXS 2510 - Laboratory Safety (1)
- EXS 2520 - Practice Management (1)
- EXS 3015 - Exercise Physiology Laboratory (1)
- EXS 3510 - Clinical Assessments (3)
- EXS 3520 - Material Characteristics (2)
- EXS 3530 - Patient Management (1)
- EXS 3540 - Fit, Function and Modifications (3)
- EXS 3550 - Neuropathic Disorders (1)
- EXS 4100 - Introduction to Personal Training (2)
- EXS 4110 - Advanced Personal Training (2)
- EXS 4200 - Physical Activity and Aging (2)
- EXS 4210 - Children and Exercise (2)
- EXS 4300 - Human Performance Enhancement (2)
- EXS 4310 - Environment and Human Performance (2)
- EXS 4400 - Obesity and Physical Activity (2)
- EXS 4500 - Healthy Lifestyle Choices (2)
- EXS 4510 - Spinal Orthotics (2)
- EXS 4520 - Upper Extremity Orthotics (2)
- EXS 4530 - Lower Extremity Orthotics (3)
- EXS 4540 - Upper Extremity Prosthetics (3)
- EXS 4550 - Lower Extremity Prosthetics (3)
- EXS 4600 - Health and Disease (2)
- EXS 4620 - Clinical Biomechanics (2)

- EXS 4630 - Basic Athletic Training (2)
- EXS 4640 - Exercise Electrocardiography (2)
- EXS 4650 - Yoga Therapy (3)
- EXS 4700 - Corporate and Worksite Wellness Programs (2)
- EXS 4800 - Exercise Endocrinology (2)
- EXS 4830 - Muscle Physiology (2)
- EXS 4900 - Special Topics (1 TO 4)
- EXS 4996 - Independent Study (1 TO 4)
- EXS 4997 - Apprentice College Teaching (1 TO 3)

Exercise Science, B.S., Concentration in Pre-Physical Therapy

Students may choose the pre-physical therapy academic concentration (see below) or complete elective credits to meet a minimum of 123 credits and satisfy university requirements for 3000/4000 level courses.

See Exercise Science, B.S. and advisor for complete details on the specialization.

Required courses:

- CDS 2100 - Medical Terminology (1)
- CDS 4010 - Human Pathology (4)
- CHM 1450 - General Chemistry II (4) and CHM 1480 - General Chemistry Laboratory II (1)
- PHY 1020 - General Physics II (4) or PHY 1520 - Introductory Physics II (4)
- PHY 1110 - General Physics Lab II (1)
- PSY 2250 - Introduction to Life-Span Developmental Psychology (4)
- PT 3020 - Physical Therapy as a Profession (2)
- Open Elective (to total 1 credit)
- EXS electives (4 credits)

General Education courses in the concentration that satisfies the following areas of requirement:

- PHY 1020 (Knowledge Application)

- PSY 2250 (Knowledge Application)

Exercise Science, B.S., Specialization in Orthotist and Prosthetist Assistant Studies

The Orthotist and Prosthetist Assistant Studies (O&P) specialization prepares students for a career as an O&P Assistant. O&P Assistants work in collaboration with clinical Orthotists and Prosthetists, as well as other healthcare providers, to design, fit and modify orthotic and prosthetic devices. They maintain a presence from the first assessment to follow up with the patient, encompassing the design, fabrication and fit of their devices.

Students pursuing a degree in Exercise Science with a Specialization in Orthotist and Prosthetist Assistant Studies must complete a minimum of 123 credits

To earn the specialization, students must meet the requirements outlined below and complete the following courses with a minimum grade of B-. See Exercise Science, B.S. and advisor for complete details on the specialization.

- CDS 2100 - Medical Terminology (1)
- EXS 2510 - Laboratory Safety (1)
- EXS 2520 - Practice Management (1)
- EXS 3510 - Clinical Assessments (3)
- EXS 3520 - Material Characteristics (2)
- EXS 3530 - Patient Management (1)
- EXS 3540 - Fit, Function and Modifications (3)
- EXS 3550 - Neuropathic Disorders (1)
- EXS 4510 - Spinal Orthotics (2)
- EXS 4520 - Upper Extremity Orthotics (2)
- EXS 4530 - Lower Extremity Orthotics (3)
- EXS 4540 - Upper Extremity Prosthetics (3)
- EXS 4550 - Lower Extremity Prosthetics (3)

Exercise Science, B.S. to M.S. 4+1 Program

This 4+1 program is a combined bachelor/master degree plan that provides high-achieving students an opportunity to complete a bachelor's and master's degree in less time than would be required if the two degrees were done independently. Participants can graduate with an M.S. in Exercise Science in approximately one calendar year after completing a B.S. in Exercise Science. Students in the program complete 12 graduate level credits at the undergraduate tuition rates. Students who have a minimum overall undergraduate GPA of 3.2 and have earned a 3.0 or above GPA in each of the 12-credits of graduate courses will be reclassified as a graduate student through the Graduate School.

Requirements for the B.S. to M.S. of Exercise Science (EXS) 4+1 Dual Degree Plan

If a student has a minimum overall GPA of 3.2, has at least junior standing, and has completed half of the department credits required for the major the student may apply to the B.S. to M.S. in EXS 4+1 program through the graduate school. Qualified applicants will be given a delayed admission to the EXS program. (Full, formal admission will not take place until the student successfully completes his or her undergraduate degree).

A student accepted into the 4+1 program continues his or her undergraduate degree with the substitution of 4 graduate courses.

If a 4+1 program student has successfully graduated with a B.S. degree and an overall GPA of 3.0, he or she is fully admitted to the M.S. in EXS program.

*See graduate catalog for additional requirements for the 4+1 program.

Students seeking the B.S. to M.S. of EXS 4+1 dual degree plan must complete a minimum of 123 credits to earn the B.S. and an additional 20 graduate credits to earn the M.S. See requirements below:

1. General Education Requirements

In order to graduate on-schedule without taking additional courses, it is highly recommended that students meet with an Undergraduate Academic Adviser concerning the selection of all of their general education courses.

Each candidate for an Oakland University baccalaureate will need to satisfactorily complete approved courses in each of the following areas: Foundation, Exploration, Integration, Writing, U.S. Diversity and Capstone. For details, refer to the Clinical and Diagnostic Sciences, B.S. section of the catalog.

2. Complete the foundational courses

- BIO 1200 - Biology I (4)
- BIO 2100 - Human Anatomy (4)
- BIO 2101 - Human Anatomy Laboratory (1) or BIO 3621 - Physiology Laboratory (1)
- BIO 2600 - Human Physiology (4) or BIO 3621 - Physiology Laboratory (1)
- CHM 1440 - General Chemistry I (4) * and CHM 1470 - General Chemistry Laboratory I (1)
- EXS 1000 - Exercise (Strength Training) and Health Enhancement (2) or EXS 1100 - Cardiovascular Fitness Training (2)

- EXS 2200 - Introduction to Exercise Science (2)
- EXS 2410 - Nutrition for Exercise, Sport and Health (3) or NTR 2500 - Human Nutrition and Health (3) and NTR 3200 - Nutrition and Physical Activity (2)
- EXS 2700 - Safety and First Aid in Exercise Settings (2)
- EXS 3010 - Exercise Physiology (3)
- EXS 3020 - Biomechanics (3)
- EXS 3030 - Motor Control (3)
- EXS 4030 - Assessment and Interventions Laboratory (3)
- EXS 4715 - Integrated Laboratory in Exercise Science (3)
- EXS 4960 - Practicum in Exercise Science (3) or EXS 4995 - Directed Research (3)
- HS 2000 - Introduction to Health and Health Behaviors (3)
- MTH 1441 - Precalculus (4) or MTH 1554 - Calculus I (4) or MTH 1331 - College Algebra (4) and MTH 1332 - Trigonometry (3)
- PHY 1010 - General Physics I (4) * or PHY 1510 - Introductory Physics I (4)
- PHY 1100 - General Physics Lab I (1)
- PSY 1000 - Introduction to Psychology (4)
- PSY 2500 - Research Design in Psychology (4)
- STA 2220 - Introduction to Statistical Concepts and Reasoning (4)

3. Complete electives in exercise science (to total 4 credits; EXS 4960 or EXS 4995 are required, but may be repeated once for credit with permission)

- EXS 1000 - Exercise (Strength Training) and Health Enhancement (2)
- EXS 1100 - Cardiovascular Fitness Training (2)
- EXS 1500 - Exercise (Judo) and Health Enhancement (2)
- EXS 2000 - Group Exercise Instruction I (2)
- EXS 2100 - Group Exercise Instruction II (2)
- EXS 2510 - Laboratory Safety (1)
- EXS 2520 - Practice Management (1)
- EXS 3015 - Exercise Physiology Laboratory (1)
- EXS 3510 - Clinical Assessments (3)
- EXS 3520 - Material Characteristics (2)

- EXS 3530 - Patient Management (1)
- EXS 3540 - Fit, Function and Modifications (3)
- EXS 3550 - Neuropathic Disorders (1)
- EXS 4100 - Introduction to Personal Training (2)
- EXS 4110 - Advanced Personal Training (2)
- EXS 4200 - Physical Activity and Aging (2)
- EXS 4210 - Children and Exercise (2)
- EXS 4300 - Human Performance Enhancement (2)
- EXS 4310 - Environment and Human Performance (2)
- EXS 4400 - Obesity and Physical Activity (2)
- EXS 4500 - Healthy Lifestyle Choices (2)
- EXS 4510 - Spinal Orthotics (2)
- EXS 4520 - Upper Extremity Orthotics (2)
- EXS 4530 - Lower Extremity Orthotics (3)
- EXS 4540 - Upper Extremity Prosthetics (3)
- EXS 4550 - Lower Extremity Prosthetics (3)
- EXS 4600 - Health and Disease (2)
- EXS 4620 - Clinical Biomechanics (2)
- EXS 4630 - Basic Athletic Training (2)
- EXS 4640 - Exercise Electrocardiography (2)
- EXS 4650 - Yoga Therapy (3)
- EXS 4700 - Corporateand Worksite Wellness Programs (2)
- EXS 4800 - Exercise Endocrinology (2)
- EXS 4830 - Musle Physiology (2)
- EXS 4900 - Special Topics (1 to 4)
- EXS 4996 - Independent Study (1 to 4)
- EXS 4997 - Apprentice College Teaching (1 to 3)

4. Graduate courses

- EXS 5010 Advanced Exercise Physiology (4)

- EXS 5020 Advanced Biomechanics (3)
- EXS 5030 Diagnostic Testing and Exercise Prescription (3)
- EXS 5040 Nutrition, Weight Management and Exercise (2)

Note

All university and departmental requirements for each of the B.S. and M.S. degrees must be satisfied to receive both degrees. The full number of credit hours required for the B.S and M.S. degrees must be completed; this includes the 12-credits of graduate courses completed as an undergraduate and approved to count towards the undergraduate and graduate degree requirements.

Exercise Science Minor

A 20-credit minor in Exercise Science is available to students in any major, other than the exercise science major, seeking a formal introduction to the exercise science field.

Courses required for the minor (13 credits)

- EXS 1000 - Exercise (Strength Training) and Health Enhancement (2) * or EXS 1100 - Cardiovascular Fitness Training (2) *
- EXS 2200 - Introduction to Exercise Science (2)
- EXS 3010 - Exercise Physiology (3)
- EXS 3020 - Biomechanics (3)
- EXS 3030 - Motor Control (3)

Choose a minimum of 7 credits of electives from the following courses:

- EXS 1000 - Exercise (Strength Training) and Health Enhancement (2) *
- EXS 1100 - Cardiovascular Fitness Training (2) *
- EXS 1500 - Exercise (Judo) and Health Enhancement (2)
- EXS 2000 - Group Exercise Instruction I (2)
- EXS 2100 - Group Exercise Instruction II (2)
- EXS 2200 - Introduction to Exercise Science (2)
- EXS 2510 - Laboratory Safety (1)
- EXS 2520 - Practice Management (1)
- EXS 2700 - Safety and First Aid in Exercise Settings (2) *
- EXS 3015 - Exercise Physiology Laboratory (1)

- EXS 3510 - Clinical Assessments (3)
- EXS 3520 - Material Characteristics (2)
- EXS 3530 - Patient Management (1)
- EXS 3540 - Fit, Function and Modifications (3)
- EXS 3550 - Neuropathic Disorders (1)
- EXS 4100 - Introduction to Personal Training (2)
- EXS 4110 - Advanced Personal Training (2)
- EXS 4200 - Physical Activity and Aging (2)
- EXS 4210 - Children and Exercise (2)
- EXS 4300 - Human Performance Enhancement (2)
- EXS 4310 - Environment and Human Performance (2)
- EXS 4400 - Obesity and Physical Activity (2)
- EXS 4500 - Healthy Lifestyle Choices (2)
- EXS 4510 - Spinal Orthotics (2)
- EXS 4520 - Upper Extremity Orthotics (2)
- EXS 4530 - Lower Extremity Orthotics (3)
- EXS 4540 - Upper Extremity Prosthetics (3)
- EXS 4550 - Lower Extremity Prosthetics (3)
- EXS 4600 - Health and Disease (2)
- EXS 4620 - Clinical Biomechanics (2)
- EXS 4630 - Basic Athletic Training (2)
- EXS 4640 - Exercise Electrocardiography (2)
- EXS 4650 - Yoga Therapy (3)
- EXS 4700 - Corporate and Worksite Wellness Programs (2)
- EXS 4800 - Exercise Endocrinology (2)
- EXS 4830 - Muscle Physiology (2)
- EXS 4900 - Special Topics (1 TO 4)
- EXS 4996 - Independent Study (1 TO 4)
- EXS 4997 - Apprentice College Teaching (1 TO 3)

- HS 2000 - Introduction to Health and Health Behaviors (3)
- HS 2150 - Stress Management (3)
- WHP 3600 - Wellness Facilitation (4)
- General Education courses in the minor that satisfies the following areas of requirement:
- HS 2000 (Natural Science and Technology)

Additional Information

Courses denoted with an asterisk (*) represent prerequisite courses for admission to the Master of Science in Exercise Science program. An additional prerequisite for admission to this graduate program is STA 2220 or STA 2226 or PSY 2510.

Orthotist and Prosthetist Assistant Studies Minor

An 18-credit minor in Orthotist and Prosthetist Assistant Studies is available to students in any major. Students in the minor will take courses from the Orthotist and Prosthetist Assistant Studies, which is part of the Bachelor of Exercise Science Degree. Orthotist and Prosthetist Assistant Studies provides preparation for a career as an Orthotist or Prosthetist Assistant. These individuals perform orthotic and prosthetic procedures and related tasks associated with patient care.

Core Courses required for the minor (13 credits)

The following courses MUST be taken with a minimum grade of B-

- CDS 2100 - Medical Terminology (1)
- EXS 2510 - Laboratory Safety (1)
- EXS 2520 - Practice Management (1) *
- EXS 3510 - Clinical Assessments (3) **
- EXS 3520 - Material Characteristics (2) ***
- EXS 3530 - Patient Management (1)
- EXS 3550 - Neuropathic Disorders (1)
- EXS 3540 - Fit, Function and Modifications (3)

* Pre-req PSY 1000

**Pre-req BIO 2100, BIO 2101, BIO 2600

*** Pre-req PHY 1010, PHY 1100

Additional Courses in Orthotist and Prosthetist Assistant Studies (5 credits)

Upon completion of the core, students must take a minimum of 5 credits with a minimum grade of B-

- EXS 4510 - Spinal Orthotics (2)
- EXS 4520 - Upper Extremity Orthotics (2)
- EXS 4530 - Lower Extremity Orthotics (3)
- EXS 4540 - Upper Extremity Prosthetics (3)
- EXS 4550 - Lower Extremity Prosthetics (3)

Health Sciences, B.S.

A Bachelor of Science in Health Sciences combines a broad spectrum of behavioral sciences, social sciences, natural and health sciences courses and electives for students who desire health focused academic experience. In addition, students choose one of three academic concentrations to obtain greater exposure to a specific health discipline: including holistic health, pre-health professional and pre-pharmacy.

Requirements for the B.S. degree with a major in Health Sciences

Students pursuing a degree in health sciences must complete the following requirements.

1. Meet the university general education requirements

In order to graduate on-schedule without taking additional courses, it is highly recommended that students meet with an Undergraduate Academic Adviser concerning the selection of all of their general education courses.

Each candidate for an Oakland University baccalaureate will need to satisfactorily complete approved courses in each of the following areas: Foundation, Exploration, Integration, Writing, and U.S. Diversity. For details, refer to the General Education Requirements section of the catalog.

2. Complete the prescribed number of credits from the following courses

- BIO 1200 - Biology I (4)*
- BIO 2100 - Human Anatomy (4)
- BIO 2101 - Human Anatomy Laboratory (1) or BIO 3621 - Physiology Laboratory (1)
- BIO 2600 - Human Physiology (4) or BIO 3620 - Medical Physiology (4) or BIO 4620 - Advanced Human Physiology (4)
- HS 2000 - Introduction to Health and Health Behaviors (3)*
- HS 3500 - Health Behavior Theories (3)*

- HS 4500 - Ethics in Health Care (4)
- PSY 1000 - Introduction to Psychology (4)* or SOC 1010 - Introduction to Sociology through Health and Medicine (4)*
- PH 3000 - Introduction to Public Health (3)*
- *Courses that also satisfy the university general education requirement.

3. Complete the course requirements specified under one of the academic concentration areas.

- Health Sciences, B.S., Concentration in Holistic Health
- Health Sciences, B.S., Concentration in Pre-Health Professional Studies
- Health Sciences, B.S., Concentration in Pre-Pharmacy

Health Sciences, B.S., Concentration in Holistic Health

The Holistic Health concentration prepares students for many traditional and non-traditional health and service-oriented professions and graduate programs.

Students completing the Health Sciences, B.S. with an academic concentration in Holistic Health must complete a minimum of 120 credits and satisfy all University degree requirements for the major in health sciences and take the following courses.

Requirements for the B.S. degree with a major in Health Sciences

Students pursuing a degree in health sciences must complete the following requirements.

Meet the university general education requirements

In order to graduate on-schedule without taking additional courses, it is highly recommended that students meet with an Undergraduate Academic Adviser concerning the selection of all of their general education courses.

Each candidate for an Oakland University baccalaureate will need to satisfactorily complete approved courses in each of the following areas: Foundation, Exploration, Integration, Writing, and U.S. Diversity. For details, refer to the General Education Requirements section of the catalog.

Complete the prescribed number of credits from the following courses

- BIO 1200 - Biology I (4)*
- BIO 2100 - Human Anatomy (4)
- BIO 2101 - Human Anatomy Laboratory (1) or BIO 3621 - Physiology Laboratory (1)

- BIO 2600 - Human Physiology (4) or BIO 3620 - Medical Physiology (4) or BIO 4620 - Advanced Human Physiology (4)
- HS 2000 - Introduction to Health and Health Behaviors (3)*
- HS 3500 - Health Behavior Theories (3)*
- HS 4500 - Ethics in Health Care (4)
- PSY 1000 - Introduction to Psychology (4)* or SOC 1010 - Introduction to Sociology through Health and Medicine (4)*
- PH 3000 - Introduction to Public Health (3)*
- *Courses that also satisfy the university general education requirement

Complete the course requirements specified under the Holistic Health Concentration

Required courses

- HS 3250 - Research Methods in Health Sciences (3) or PSY 2500 - Research Design in Psychology (4)
- HS 3400 - Contemporary Topics in Health (3)
- HS 3410 - Integrative Holistic Health (3)
- HS 4430 - Modalities for Healing (3)
- HS 4440 - Healing Traditions (3)
- HS 4450 - Laughter as Therapeutic Modality (3)
- HS 4460 - Mindfulness (3)
- WHP 3500 - Health Program Implementation (4)
- WHP 3700 - Culture, Ethnicity and Well-being (3)

Number of required elective credits varies

The number of required elective credits varies based on core courses completed and are selected with assistance from your academic adviser, based on your career goals, from an approved list of courses. Students must achieve a minimum of 120 total course credits and satisfy all University degree requirements to graduate.

A minimum of 34 credits from these Holistic Health concentration elective courses.

- AHS 3310 - Health Care Safety (4)
- AHS 3320 - Delivering Safe Patient Care (4)
- AHS 3340 - Hospital Safety and Health (4)
- AHS 4310 - Ergonomics in the Health Care Industry (3)

- AHS 4320 - Risk Reduction Safety Culture Improvement in Healthcare (2)
- AN 3220 - Medical Anthropology (4)
- BIO 1201 - Biology Laboratory (1)
- BIO 1300 - Biology II (4)
- BIO 3130 - Developmental Biology (4)
- BIO 3230 - Fundamentals of Biochemistry (4)
- BIO 3232 - Biochemistry I (4)
- BIO 3233 - Biochemistry I Laboratory (1)
- BIO 3330 - Ecology (5)
- BIO 3332 - Field Biology (4)
- BIO 3400 - Genetics (4)
- BIO 3401 - Genetics Laboratory (1)
- BIO 3500 - General Microbiology (4)
- BIO 3501 - General Microbiology Laboratory (1)
- BIO 4120 - Neuroanatomy (4)
- CDS 2100 - Medical Terminology (1)
- CDS 4010 - Human Pathology (4)
- CDS 4050 - Pharmacology (3)
- CDS 4250 - Medical Biochemistry (4)
- CDS 4300 - Clinical Microbiology (4)
- CDS 4320 - Medical Microbiology Laboratory (1)
- CHM 1040 - Introduction to Chemical Principles (4)
- CHM 1440 - General Chemistry I (4) and CHM 1470 - General Chemistry Laboratory I (1)
- CHM 1450 - General Chemistry II (4) and CHM 1480 - General Chemistry Laboratory II (1)
- CHM 2010 - Introduction to Organic and Biological Chemistry (4)
- CHM 2340 - Organic Chemistry I (4)
- CHM 2350 - Organic Chemistry II (4)
- CHM 2370 - Organic Chemistry Laboratory (2)
- CHM 4254 - Biochemistry I (3)

- CHM 4257 - Biochemistry Laboratory (3)
- COM 1500 - Introduction to American Sign Language (4)
- COM 2000 - Public Speaking (4)
- EXS 2200 - Introduction to Exercise Science (2)
- EXS 2700 - Safety and First Aid in Exercise Settings (2)
- EXS 3010 - Exercise Physiology (3)
- EXS 3015 - Exercise Physiology Laboratory (1)
- EXS 3020 - Biomechanics (3)
- EXS 4100 - Introduction to Personal Training (2)
- EXS 4300 - Human Performance Enhancement (2)
- EXS 4400 - Obesity and Physical Activity (2)
- EXS 4500 - Healthy Lifestyle Choices (2)
- EXS 4600 - Health and Disease (2)
- EXS 4620 - Clinical Biomechanics (2)
- EXS 4630 - Basic Athletic Training (2)
- EXS 4650 - Yoga Therapy (3)
- EXS 4810 - Physical Activity Epidemiology (2)
- HS 1000 - Careers in Health (1)
- HS 2150 - Stress Management (3)
- HS 3430 - Sociology of Health and Medicine (4)
- HS 3440 - Introduction to Community Engagement (4)
- HS 3450 - Leadership and Healthcare (4)
- HS 3460 - Community Engaged Research Experience (4)
- HS 4550 - Qualitative Research Methods (4)
- HS 4900 - Special Topics (2 TO 4)
- MTH 1441 - Precalculus (4)
- MTH 1554 - Calculus I (4)
- NTR 2500 - Human Nutrition and Health (3)
- NTR 2700 - Introduction to Food Science (3)

- NTR 3120 - Community Nutrition (3)
- NTR 3140 - Food, Nutrition, and Culture (3) *
- NTR 3200 - Nutrition and Physical Activity (2)
- NTR 3210 - Herbs Supplements Nutrition (2)
- NTR 3220 - Eating Disorders (2)
- NTR 3230 - Foodborne Illnesses (2)
- NTR 3260 - Food Politics (2)
- NTR 4100 - Nutrition and Lifecycles (4)
- NTR 4350 - Nutrient Metabolism (4)
- PH 3350 - Principles of Environmental Health Sciences (4)
- PH 4650 - Social Determinants of Health (4)
- PH 4750 - Global Health and Social Issues (4)
- PHY 1010 - General Physics I (4)
- PHY 1020 - General Physics II (4)
- PHY 1080 - Principles of Physics I (4)
- PHY 1090 - Principles of Physics II (4)
- PHY 1100 - General Physics Lab I (1)
- PHY 1110 - General Physics Lab II (1)
- PHY 1510 - Introductory Physics I (4)
- PHY 1520 - Introductory Physics II (4)
- PHY 3260 - Medical Physics (4)
- PSY 2250 - Introduction to Life-Span Developmental Psychology (4)
- PSY 3210 - Child Development (4)
- PSY 3220 - Adolescence and Youth (4)
- PSY 3230 - Adulthood and Aging (4)
- PSY 3330 - Motivation (4)
- PSY 3450 - Health Psychology (4)
- SOC 1000 - Introduction to Sociology (4)
- STA 2220 - Introduction to Statistical Concepts and Reasoning (4)

- WHP 3250 - Issues in Women's Health (4)
- WHP 3600 - Wellness Facilitation (4)
- WHP 3800 - Persuasion and Marketing in Health Promotion (4)
- WHP 4000 - Assessment and Interventions in Wellness (4)
- WHP 4030 - Laboratory in Assessment and Interventions (4)
- WHP 4310 - Crisis Intervention and Prevention of Self Harm (4)
- WHP 4350 - Environmental Justice (4)
- WHP 4850 - Population Health, Health Policy, and Healthcare Delivery (4)
- WHP 4900 - Special Topics (1 TO 4)
- WRT 1050 - Composition I (4)
- or any other course approved by the program director in writing through approved petition of exception form

Health Sciences, B.S., Concentration in Pre-Health Professional Studies

The pre-health professional concentration incorporates natural science courses to prepare students for the traditional application requirements for medical, dental, optometric, physician assistant and other professional schools.

Students completing the Health Sciences, B.S. with a concentration in pre-health professional studies must complete a minimum of 120 credits and satisfy all University degree requirements for the major in health sciences and take the following courses for the concentration.

Requirements for the B.S. degree with a major in Health Sciences

Students pursuing a degree in health sciences must complete the following requirements.

Meet the university general education requirements

In order to graduate on-schedule without taking additional courses, it is highly recommended that students meet with an Undergraduate Academic Adviser concerning the selection of all of their general education courses.

Each candidate for an Oakland University baccalaureate will need to satisfactorily complete approved courses in each of the following areas: Foundation, Exploration, Integration, Writing, and U.S. Diversity. For details, refer to the General Education Requirements section of the catalog.

Complete the prescribed number of credits from the following courses

- BIO 1200 - Biology I (4)*
- BIO 2100 - Human Anatomy (4)
- BIO 2101 - Human Anatomy Laboratory (1) or BIO 3621 - Physiology Laboratory (1)
- BIO 2600 - Human Physiology (4) or BIO 3620 - Medical Physiology (4) or BIO 4620 - Advanced Human Physiology (4)
- HS 2000 - Introduction to Health and Health Behaviors (3)*
- HS 3500 - Health Behavior Theories (3)*
- HS 4500 - Ethics in Health Care (4)
- PSY 1000 - Introduction to Psychology (4)* or SOC 1010 - Introduction to Sociology through Health and Medicine (4)*
- PH 3000 - Introduction to Public Health (3)*
- *Courses that also satisfy the university general education requirement.

Complete the course requirements specified under Pre-Health Professional Studies

Required courses

- BIO 1300 - Biology II (4) *
- CDS 4000 - Medical Genetics (4) or BIO 3400 - Genetics (4)
- CDS 4250 - Medical Biochemistry (4) or BIO 3232 - Biochemistry I (4)
- CHM 1440 - General Chemistry I (4) * and CHM 1470 - General Chemistry Laboratory I (1)
- CHM 1450 - General Chemistry II (4) and CHM 1480 - General Chemistry Laboratory II (1)
- CHM 2340 - Organic Chemistry I (4)
- CHM 2350 - Organic Chemistry II (4)
- CHM 2370 - Organic Chemistry Laboratory (2)
- HS 3250 - Research Methods in Health Sciences (3) or PSY 2500 - Research Design in Psychology (4) or PSY 2250 - Introduction to Life-Span Developmental Psychology (4)
- NTR 2500 - Human Nutrition and Health (3)
- MTH 1441 - Precalculus (4) or MTH 1554 - Calculus I (4)
- STA 2220 - Introduction to Statistical Concepts and Reasoning (4) or EHS 2550 - Basic Statistics for Health Sciences (3)
- PHY 1010 - General Physics I (4) * or PHY 1510 - Introductory Physics I (4)
- PHY 1100 - General Physics Lab I (1)

Complete a minimum of 11 credits from the following: (At least 10 credits at 3000-4000 level)

The number of required elective credits varies based on core courses completed and are selected with assistance from your academic adviser, based on your career goals, from an approved list of courses. Students must achieve a minimum of 120 total course credits and satisfy all University degree requirements to graduate.

Note: Courses required for the major and the concentration cannot be counted as an elective. Students are required to satisfy the university's upper level requirement by completing at least 32 credit hours at the upper level (3000-4000).

- AHS 3310 - Health Care Safety (4)
- AHS 3320 - Delivering Safe Patient Care (4)
- AHS 3340 - Hospital Safety and Health (4)
- BCM 4254 - Biochemistry I (3)
- BIO 3000 - Biology and Society (4)
- BIO 3130 - Developmental Biology (4)
- BIO 3230 - Fundamentals of Biochemistry (4)
- BIO 3232 - Biochemistry I (4)
- BIO 3233 - Biochemistry I Laboratory (1)
- BIO 3330 - Ecology (5)
- BIO 3332 - Field Biology (4)
- BIO 3400 - Genetics (4)
- BIO 3401 - Genetics Laboratory (1)
- BIO 3500 - General Microbiology (4)
- BIO 3501 - General Microbiology Laboratory (1)
- BIO 4620 - Advanced Human Physiology (4)
- CDS 2100 - Medical Terminology (1)
- CDS 4000 - Medical Genetics (4)
- CDS 4050 - Pharmacology (3)
- CDS 4250 - Medical Biochemistry (4)
- CDS 4300 - Clinical Microbiology (4)
- CDS 4320 - Medical Microbiology Laboratory (1)

- CHM 4254 - Biochemistry I (3)
- CHM 4257 - Biochemistry Laboratory (3)
- EXS 3010 - Exercise Physiology (3)
- EXS 3015 - Exercise Physiology Laboratory (1)
- EXS 3020 - Biomechanics (3)
- EXS 4300 - Human Performance Enhancement (2)
- EXS 4400 - Obesity and Physical Activity (2)
- EXS 4500 - Healthy Lifestyle Choices (2)
- EXS 4600 - Health and Disease (2)
- EXS 4620 - Clinical Biomechanics (2)
- EXS 4630 - Basic Athletic Training (2)
- EXS 4810 - Physical Activity Epidemiology (2)
- HS 1000 - Careers in Health (1)
- HS 2150 - Stress Management (3)
- HS 3400 - Contemporary Topics in Health (3)
- HS 3430 - Sociology of Health and Medicine (4)
- HS 3440 - Introduction to Community Engagement (4)
- HS 3450 - Leadership and Healthcare (4)
- HS 3460 - Community Engaged Research Experience (4)
- HS 4450 - Laughter as Therapeutic Modality (3)
- NTR 3120 - Community Nutrition (3)
- NTR 3140 - Food, Nutrition, and Culture (3) *
- NTR 3200 - Nutrition and Physical Activity (2)
- NTR 3210 - Herbs Supplements Nutrition (2)
- NTR 3220 - Eating Disorders (2)
- NTR 3230 - Foodborne Illnesses (2)
- NTR 4100 - Nutrition and Lifecycles (4)
- NTR 4200 - Communication and Counseling in Nutrition Practice (4)
- NTR 4300 - Food Service Management (4)

- NTR 4350 - Nutrient Metabolism (4)
- PH 4750 - Global Health and Social Issues (4)
- PHY 3260 - Medical Physics (4)
- PSY 2250 - Introduction to Life-Span Developmental Psychology (4)
- PSY 3010 - The Psychology of Human Sexuality (4)
- PSY 3020 - Evolution, Science, and Superstition (4)
- PSY 3030 - Evolutionary Psychology (4)
- PSY 3040 - Animal Behavior (4)
- PSY 3100 - Creativity and Innovation (4)
- PSY 3160 - Cognitive Psychology (4)
- PSY 3180 - Biological Psychology (4)
- PSY 3210 - Child Development (4)
- PSY 3220 - Adolescence and Youth (4)
- PSY 3230 - Adulthood and Aging (4)
- PSY 3330 - Motivation (4)
- PSY 3340 - Industrial and Organizational Psychology (4)
- PSY 3370 - Group Dynamics (4)
- PSY 3390 - Emotion (4)
- PSY 3410 - Adult Psychopathology (4)
- PSY 3430 - Child Psychopathology (4)
- PSY 3440 - Behavior Analysis (4)
- PSY 3450 - Health Psychology (4)
- WHP 3250 - Issues in Women's Health (4)
- WHP 3500 - Health Program Implementation (4)
- WHP 3600 - Wellness Facilitation (4)
- WHP 3800 - Persuasion and Marketing in Health Promotion (4)
- WHP 4000 - Assessment and Interventions in Wellness (4)
- WHP 4030 - Laboratory in Assessment and Interventions (4)
- WHP 4310 - Crisis Intervention and Prevention of Self Harm (4)

- WHP 4850 - Population Health, Health Policy, and Healthcare Delivery (4)
- WHP 4900 - Special Topics (1 TO 4)
- or any other course approved by the program director in writing through approved petition exception form

Health Sciences, B.S., Concentration in Pre-Pharmacy

Students pursuing a Health Sciences, B.S. at Oakland University with a pre-pharmacy concentration may pursue admission to any accredited Doctor of Pharmacy program. Students may complete their senior year of coursework at any PharmD program and credits earned from courses at this program will be transferred back to OU to complete the requirements for the Bachelor of Science with a major in health sciences program. It is highly recommended that students consult with the academic adviser prior to enrolling in any of these classes, as completion of coursework does not guarantee admission or completion of the program. Admission into an accredited PharmD program is required to complete this degree. Admission to a PharmD program is through a competitive admissions process. Once accepted, Oakland students will need to: 1) send a letter of acceptance to their academic adviser; 2) register for classes and pay tuition through the PharmD school; and 3) send official transcripts after the first year (fall/winter semesters) of the PharmD program to Oakland University.

Students must achieve a minimum of 120 total course credits with a minimum of 32 upper level (3000-4000) course credits and satisfy all University degree requirements for the major in health sciences and take the concentration courses Completion of this concentration requires at least one year of a professional accredited pharmacy school with no fewer than 20 credits of professional PharmD coursework. Students are required to meet with their assigned academic adviser to discuss the details of the degree requirements.

Students completing the Bachelor of Science in health sciences with a concentration in pre-pharmacy studies must complete a minimum of 120 credits and satisfy all University degree requirements for the major in health sciences and take the following courses for the concentration.

Requirements for the B.S. degree with a major in Health Sciences

Students pursuing a degree in health sciences must complete the following requirements.

Meet the university general education requirements

In order to graduate on-schedule without taking additional courses, it is highly recommended that students meet with an Undergraduate Academic Adviser concerning the selection of all of their general education courses.

Each candidate for an Oakland University baccalaureate will need to satisfactorily complete approved courses in each of the following areas: Foundation, Exploration, Integration, Writing, and U.S. Diversity. For details, refer to the General Education Requirements section of the catalog.

Complete the prescribed number of credits from the following courses

- BIO 1200 - Biology I (4)*
- BIO 2100 - Human Anatomy (4)
- BIO 2101 - Human Anatomy Laboratory or BIO 3621 - Physiology Laboratory (1)
- BIO 2600 - Human Physiology (4) orBIO 3620 - Medical Physiology (4) or BIO 4620 - Advanced Human Physiology (4)
- HS 2000 - Introduction to Health and Health Behaviors (3)*
- HS 3500 - Health Behavior Theories (3)*
- HS 4500 - Ethics in Health Care (4)
- PSY 1000 - Introduction to Psychology (4)* or SOC 1010 - Introduction to Sociology through Health and Medicine (4)*
- PH 3000 - Introduction to Public Health (3)*
- *Courses that also satisfy the university general education requirement

Complete the course requirements specified under the Pre-Pharmacy Concentration

1. Required courses

- CDS 2100 - Medical Terminology (1)
- CDS 4250 - Medical Biochemistry (4) or CDS 4000 - Medical Genetics (4) or BIO 3400 - Genetics (4)
- CDS 4300 - Clinical Microbiology (4) or BIO 3500 - General Microbiology (4)
- CDS 4320 - Medical Microbiology Laboratory (1) or BIO 3501 - General Microbiology Laboratory (1)
- CHM 1440 - General Chemistry I (4) and CHM 1470 - General Chemistry Laboratory I (1)
- CHM 1450 - General Chemistry II (4) and CHM 1480 - General Chemistry Laboratory II (1)
- CHM 2340 - Organic Chemistry I (4)
- CHM 2350 - Organic Chemistry II (4)
- CHM 2370 - Organic Chemistry Laboratory (2)
- COM 2000 - Public Speaking (4)
- MTH 1554 - Calculus I (4)

- PHY 1010 - General Physics I (4) or PHY 1510 - Introductory Physics I (4)
- PHY 1100 - General Physics Lab I (1)
- STA 2220 - Introduction to Statistical Concepts and Reasoning (4) or EHS 2550 - Basic Statistics for Health Sciences (3)

PharmD coursework minimum of 20 credits transferred to Oakland University

- General Education courses in the concentration that satisfies the following areas of requirement:
- CHM 1440 & CHM 1470 (Natural Science and Technology)
- COM 2000 (Knowledge Applications)
- MTH 1554 (Formal Reasoning)
- PHY 1010 or PHY 1510 and PHY 1100 (Natural Science and Technology)
- STA 2220 or EHS 2550 (Formal Reasoning)

2. PharmD coursework minimum of 20 credits transferred to Oakland University

OR

substitute an equivalent number of elective credits

Students not entering a PharmD program may substitute an equivalent number of elective credits. Number of required elective credits required vary based on core courses completed and are selected with assistance from your academic adviser, based on your career goals, from an approved list of courses.

Note

Electives are the same as the Health Sciences, B.S., Concentration in Pre-Health Professional Studies electives.

Interdisciplinary Healthcare Studies, B.S. (Pending Board Approval)

A Bachelor of Science in Interdisciplinary Healthcare Studies offers an opportunity to acquire health expertise across disciplines that allow students to pursue a health science degree that extends beyond training for direct clinical care provision. This degree positions students to pursue job opportunities in a variety of supportive and non-clinical positions in healthcare.

Requirements for the B.S. degree with a major in Interdisciplinary Healthcare Studies, B.S.

Students pursuing a degree in Interdisciplinary Healthcare Studies must complete a minimum of 120 credits, including the following requirements.

1. Meet the university general education requirements

In order to graduate on-schedule without taking additional courses, it is highly recommended that students meet with an Undergraduate Academic Adviser concerning the selection of all of their general education courses.

Each candidate for an Oakland University baccalaureate will need to satisfactorily complete approved courses in each of the following areas: Foundation, Exploration, Integration, Writing, U.S. Diversity and Capstone. For details, refer to the General Education Requirements section of the catalog.

2. Complete the Health Systems required courses

- BIO 1200 - Biology I (4) *
- BIO 2006 - Clinical Anatomy and Physiology (5)
- CDS 2100 - Medical Terminology (1)
- EHS 2550 - Basic Statistics for Health Sciences (3)*
- ECN 1500 - Economics in Today's World (4)*
- HS 2000 - Introduction to Health and Health Behaviors (3) *
- HS 3250 - Research Methods in Health Sciences (3)
- HS 3300 - Interdisciplinary Health Knowledge Applications I (2)
- HS 3310 - Interdisciplinary Health Knowledge Applications II (2)
- HS 3320 - Dissemination of Health Information and Research (3)
- HS 3430 - Sociology of Health and Medicine (4)
- HS 3440 - Introduction to Community Engagement (4)
- HS 3450 - Leadership and Healthcare (4)
- HS 3500 - Health Behavior Theories (3)*
- HS 4200 - Human Disease Management and Healthcare (3)
- HS 4500 - Ethics in Health Care (4) *
- MIS 1000 - Business Problem Solving with Information Technology (3) or CSI 1200 - Introduction to Computing and Programming using Excel (4)
- MIS 3010 - Survey of Management Information Systems (3)
- PH 3000 - Introduction to Public Health (3)*
- PH 4750 - Global Health and Social Issues (4)

- PHL 1320 - Introduction to Ethics for Healthcare Professions (4) *
- POM 3000 - Survey of Operations Management (3)
- PSY 1000 - Introduction to Psychology (4) *
- SOC 1000 - Introduction to Sociology (4)*
- WHP 2800 - Introduction to Health Literacy (4)
- WHP 4850 - Population Health, Health Policy, and Healthcare Delivery (4)

*Courses that also satisfy the university general education requirement.

3. Complete a minimum of 12 credits

The number of required elective credits varies based on core courses completed. Students are encouraged to work with their academic adviser to assist with credit requirements. Students must achieve a minimum of 120 total course credits hours and satisfy all University degree requirements to graduate. Students may apply the elective credits courses as part of a minor.

Note

Courses required for the major and the concentration cannot be counted as an elective. Students are required to satisfy the university's upper level requirement by completing at least 32 credit hours at the upper level (3000-4000).

Nutrition, B.S.

The Bachelor of Science in Nutrition (NTR) degree provides coursework in a wide array of nutritional domains, including community nutrition, medical nutrition therapy, and food science, among others. This degree positions students to pursue post-bachelor nutrition and wellness job opportunities in health care, nonprofit, government, industry, and academic settings. Students can apply for the dietetics specialization in their sophomore year, for entry in their junior year. The NTR degree also prepares students for graduate programs in nutrition, public health, and other health professions.

Requirements for the major in nutrition, B.S. program

Students completing a B.S. degree in Nutrition must complete a minimum of 120 credits and the following:

1. Meet the university general education requirements

In order to graduate on-schedule without taking additional courses, it is highly recommended that students meet with an Undergraduate Academic Adviser concerning the selection of all of their general education courses.

Each candidate for an Oakland University baccalaureate will need to satisfactorily complete approved courses in each of the following areas: Foundation, Exploration, Integration, Writing, U.S. Diversity, and Capstone. For details, refer to the General Education Requirements section of the catalog.

2. Complete the Nutrition core courses

- BIO 1200 - Biology I (4)
- BIO 2006 - Clinical Anatomy and Physiology (5) or BIO 2100 - Human Anatomy (4) and BIO 2600 - Human Physiology (4)
- CDS 2100 - Medical Terminology (1)
- CDS 3300 - Microbiology of Infectious Diseases (3) or BIO 3500 - General Microbiology (4) or BIO 3520 - Introduction to Human Microbiology (4)
- CDS 4250 - Medical Biochemistry (4)
- CHM 1440 - General Chemistry I (4)
- CHM 1450 - General Chemistry II (4)
- CHM 1470 - General Chemistry Laboratory I (1)
- CHM 1480 - General Chemistry Laboratory II (1)
- CHM 2340 - Organic Chemistry I (4)
- EHS 2550 - Basic Statistics for Health Sciences (3) or STA 2220 - Introduction to Statistical Concepts and Reasoning (4)
- HS 2000 - Introduction to Health and Health Behaviors (3) *
- HS 3500 - Health Behavior Theories (3) *
- NTR 1000 - Careers in Nutrition (1)
- NTR 2500 - Human Nutrition and Health (3)
- NTR 2650 - Nutrition Assessment Methods (3)
- NTR 2651 - Nutrition Assessment Methods Laboratory (1)
- NTR 2700 - Introduction to Food Science (3)
- NTR 2750 - Introduction to Cooking and Culinary Science (2)
- NTR 3000 - Nutrition Research Methods (3)
- NTR 3120 - Community Nutrition (3)
- NTR 3140 - Food, Nutrition, and Culture (3) *
- NTR 3230 - Foodborne Illnesses (2) - Not required for the Specialization in Dietetics

- NTR 4100 - Nutrition and Lifecycles (4)
- NTR 4350 - Nutrient Metabolism (4)
- NTR 4400 - Medical Nutrition Therapy I (4)
- PH 3000 - Introduction to Public Health (3) *
- PSY 1000 - Introduction to Psychology (4) or SOC 1000 - Introduction to Sociology (4) *
- WRT 1060 - Composition II (4)

*Courses that also satisfy the university general education requirement

3. Communication and ethics requirements

All students majoring in nutrition are required to take one (1) communication and one (1) ethics course related to health and nutrition. In addition, dietetics specialization students are required to take the NTR 4200 - Communication and Counseling in Nutrition Practice and NTR 4500 - Professional Practice & Ethics in Nutrition.

- NTR 4200 - Communication and Counseling in Nutrition Practice (4) or WHP 2800 - Introduction to Health Literacy (4) or COM 4402 - Health Communication (4)
- NTR 4500 - Professional Practice & Ethics in Nutrition (3) or HS 4500 - Ethics in Health Care (4)

Other requirements

Students are required to complete the Dietetics Specialization, or the minimum number of elective credits to achieve a minimum of 120 total course credits with a minimum of 32 upper level (3000-4000) course credits and satisfy all University degree requirements to graduate.

4. Electives for the Nutrition major

Number of required elective credits varies based on core courses completed and are selected with assistance from your academic adviser, based on your career goals, from an approved list of courses. Students must achieve a minimum of 120 total course credits with a minimum of 32 upper level (3000-4000) course credits and satisfy all University degree requirements to graduate.

Note: Courses required for the major and the specialization cannot be counted as an elective.

- AN 3133 - The Food Quest (4) or ENV 3220 - The Food Quest (4)
- AN 3220 - Medical Anthropology (4)
- BIO 2100 - Human Anatomy (4)
- BIO 2101 - Human Anatomy Laboratory (1)
- BIO 3360 - Organic Farming (4)
- BIO 3361 - Applied Organic Farming (1)
- BIO 3400 - Genetics (4)

- BIO 4220 - Cell Biology of Cancer (4)
- BIO 4338 - Food Systems Biology (4)
- BIO 4900 - Selected Topics in Biology (1 TO 5)
- CDS 2010 - Careers in Clinical and Diagnostic Sciences (1)
- CDS 2070 - Health Care Systems Around the World (3)
- CDS 3310 - Microbiology of Infectious Diseases Laboratory (1)
- CDS 4000 - Medical Genetics (4)
- CDS 4010 - Human Pathology (4)
- CDS 4300 - Clinical Microbiology (4)
- CDS 4310 - Clinical Microbiology Laboratory (1)
- CHM 2340 - Organic Chemistry I (4)
- CHM 2350 - Organic Chemistry II (4)
- COM 2000 - Public Speaking (4)
- COM 2001 - Professional Communication (4)
- COM 2403 - Group Dynamics and Communication (4)
- COM 3200 - Persuasion (4)
- COM 3402 - Communication in Leadership (4)
- ECN 2000 - Principles of Macroeconomics (4)
- ECN 2010 - Principles of Microeconomics (4)
- ECN 3670 - Economics of Health Care (3)
- EXS 2700 - Safety and First Aid in Exercise Settings (2)
- EXS 3010 - Exercise Physiology (3)
- EXS 3015 - Exercise Physiology Laboratory (1)
- EXS 3020 - Biomechanics (3)
- EXS 3030 - Motor Control (3)
- EXS 4100 - Introduction to Personal Training (2)
- EXS 4200 - Physical Activity and Aging (2)
- EXS 4210 - Children and Exercise (2)
- EXS 4300 - Human Performance Enhancement (2)

- EXS 4400 - Obesity and Physical Activity (2)
- EXS 4500 - Healthy Lifestyle Choices (2)
- EXS 4600 - Health and Disease (2)
- EXS 4620 - Clinical Biomechanics (2)
- EXS 4630 - Basic Athletic Training (2)
- EXS 4800 - Exercise Endocrinology (2)
- EXS 4810 - Physical Activity Epidemiology (2)
- HRD 4320 - Program Evaluation (4)
- HS 1000 - Careers in Health (1)
- HS 2150 - Stress Management (3)
- HS 3410 - Integrative Holistic Health (3)
- HS 3430 - Sociology of Health and Medicine (4)
- HS 3440 - Introduction to Community Engagement (4)
- HS 3450 - Leadership and Healthcare (4)
- HS 3460 - Community Engaged Research Experience (4)
- HS 4430 - Modalities for Healing (3)
- HS 4440 - Healing Traditions (3)
- HS 4450 - Laughter as Therapeutic Modality (3)
- HS 4460 - Mindfulness (3)
- HS 4550 - Qualitative Research Methods (4)
- HS 4900 - Special Topics (2 TO 4)
- MIS 3020 - Information Systems and Healthcare Informatics (3)
- MKT 4040 - Consumer Behavior (4)
- MTH 1554 - Calculus I (4)
- NTR 3200 - Nutrition and Physical Activity (2)
- NTR 3210 - Herbs Supplements Nutrition (2)
- NTR 3220 - Eating Disorders (2)
- NTR 3260 - Food Politics (2)
- NTR 3300 - Organizational Behavior and Health Care Systems (3)

- PHY 1010 - General Physics I (4)
- PHY 1100 - General Physics Lab I (1)
- PHY 1020 - General Physics II (4)
- PHY 1110 - General Physics Lab II (1)
- PS 3340 - Public Policy and Health Care (4)
- PSY 2250 - Introduction to Life-Span Developmental Psychology (4)
- PSY 2360 - Introduction to Individual Differences and Personality Psychology (4)
- PSY 3210 - Child Development (4)
- PSY 3220 - Adolescence and Youth (4)
- PSY 3230 - Adulthood and Aging (4)
- PSY 3330 - Motivation (4)
- PSY 3440 - Behavior Analysis (4)
- PSY 3450 - Health Psychology (4)
- PSY 3500 - Introduction to Psychometrics (4)
- SOC 3430 - Sociology of Health and Medicine (4)
- WHP 2800 - Introduction to Health Literacy (4)
- WHP 3000 - Wellness for Special Populations (4)
- WHP 3500 - Health Program Implementation (4)
- WHP 3600 - Wellness Facilitation (4)
- WHP 3800 - Persuasion and Marketing in Health Promotion (4)
- WHP 4000 - Assessment and Interventions in Wellness (4)
- WHP 4030 - Laboratory in Assessment and Interventions (4)
- WHP 4350 - Environmental Justice (4)
- WHP 4850 - Population Health, Health Policy, and Healthcare Delivery (4)
- WHP 4900 - Special Topics (1 TO 4)
- WRT 1050 - Composition I (4)
- or any other course approved by the program director in writing through approved petition exception form

Nutrition, B.S., Specialization in Dietetics

The dietetics specialization provides coursework and experiential learning for students interested in pursuing a career in the field of nutrition and dietetics.

Students in the dietetics specialization fulfill the same requirements as the Nutrition Major with the additional classes

- NTR 3100 - Dietetics Seminar (1)
- NTR 3300 - Organizational Behavior and Health Care Systems (3)
- NTR 4300 - Food Service Management (4)
- NTR 4450 - Medical Nutrition Therapy II (4)
- NTR 4600 - Community Nutrition Practicum (4)

As stated in the Nutrition B.S. Communication and Ethics Requirement (Item 3), dietetics specialization students are required to take the NTR 4200 - Communication and Counseling in Nutrition Practice and NTR 4500 - Professional Practice and Ethics in Nutrition to meet the Communication and Ethics requirements of the Nutrition major.

Applications for entry into the dietetics specialization

There is a competitive application process for entry into the dietetics specialization which includes the following requirements/ components.

- A minimum grade of B- in NTR 2500
- Grade point average for science courses (recommended minimum 2.
- Overall GPA (recommended minimum 2.8)
- Personal statement
- Application

To apply, students must complete (or be enrolled in*):

- BIO 1200 - Biology I (4)
- BIO 2600 - Human Physiology (4) and BIO 3621 - Physiology Laboratory (1) or BIO 2006 - Clinical Anatomy and Physiology (5)
- CDS 3300 - Microbiology of Infectious Diseases (3) or BIO 3500 - General Microbiology (4) or BIO 3520 - Introduction to Human Microbiology (4)
- CHM 1440 - General Chemistry I (4)
- CHM 1450 - General Chemistry II (4)
- CHM 1470 - General Chemistry Laboratory I (1)

- CHM 1480 - General Chemistry Laboratory II (1)
- CHM 2340 - Organic Chemistry I (4)
- EHS 2550 - Basic Statistics for Health Sciences (3) or STA 2220 - Introduction to Statistical Concepts and Reasoning (4)
- HS 2000 - Introduction to Health and Health Behaviors (3)
- HS 3500 - Health Behavior Theories (3)
- NTR 1000 - Careers in Nutrition (1)
- NTR 2500 - Human Nutrition and Health (3)
- NTR 2650 - Nutrition Assessment Methods (3)
- NTR 2651 - Nutrition Assessment Methods Laboratory (1)
- PH 3000 - Introduction to Public Health (3)
- WRT 1060 - Composition II (4)

* Admittance will be conditional upon successful completion of courses in progress at the time of application

Graduation requirements

Students must complete all Nutrition courses with a minimum grade of C, achieve a minimum grade of B- in Community Nutrition Practicum and maintain a 2.5 cumulative GPA to graduate with a specialization in Dietetics. They must also have documented 20 hours of nutrition-focused community service or volunteer work.

Community Health Engagement Minor

A minor in Community Health Engagement is available to students in any degree program. The minor provides students with hands-on learning opportunities focused in real-world community settings to learn about health engagement in diverse populations. A minimum of 18 credits are required for the minor including 15 core credits and a minimum of 3 elective credits.

Core required courses for the minor (15 credits):

- HS 3440 - Introduction to Community Engagement (4)
- HS 3450 - Leadership and Healthcare (4)
- HS 3460 - Community Engaged Research Experience (4)
- PH 3000 - Introduction to Public Health (3) *

- Courses that satisfy the university general education requirements

Elective courses (minimum of 3 credits):

- AN 3220 - Medical Anthropology (4)
- HS 3430 - Sociology of Health and Medicine (4) or PH 4650 - Social Determinants of Health (4) or WHP 3700 - Culture, Ethnicity and Well-being (3)
- HS 4900 - Special Topics (2 TO 4)
- HS 4995 - Directed Study (1 TO 4)
- NTR 3120 - Community Nutrition (3)
- PH 4750 - Global Health and Social Issues (4)
- WHP 3700 - Culture, Ethnicity and Well-being (3)
- WHP 4350 - Environmental Justice (4)

Holistic Health Minor

A minor in Integrative Holistic Health is available to students in any degree program. A minimum of 18 credits are required for the minor including 15 core credits and a minimum of 3 elective credits.

Courses required for the minor (15 credits):

- HS 3410 - Integrative Holistic Health (3)
- HS 4430 - Modalities for Healing (3)
- HS 4440 - Healing Traditions (3)
- HS 4450 - Laughter as Therapeutic Modality (3)
- HS 4460 - Mindfulness (3)

Choose at least 3 credits of electives from the following courses:

- AN 3220 - Medical Anthropology (4)
- EXS 4650 - Yoga Therapy (3)
- HS 2150 - Stress Management (3)
- HS 3400 - Contemporary Topics in Health (3)
- HS 3430 - Sociology of Health and Medicine (4) or WHP 3700 - Culture, Ethnicity and Well-being (3)
- HS 4900 - Special Topics (2 TO 4)

- HS 4995 - Directed Study (1 TO 4)
- NTR 3210 - Herbs Supplements Nutrition (2)
- PH 4650 - Social Determinants of Health (4)
- PSY 3180 - Biological Psychology (4)
- PSY 3450 - Health Psychology (4)

Nutrition and Health Minor

A minor in Nutrition and Health is available to students in any degree program. A minimum of 19 credits are required for the minor including 17 core credits and 2 elective credits. A minimum grade of C is required in each course for the minor.

Core courses (17 credits):

- NTR 2500 - Human Nutrition and Health (3)
- NTR 2650 - Nutrition Assessment Methods (3)
- NTR 2651 - Nutrition Assessment Methods Laboratory (1)
- NTR 4100 - Nutrition and Lifecycles (4)
- NTR 3120 - Community Nutrition (3)
- NTR 3140 - Food, Nutrition, and Culture (3) *
- * Courses that satisfy the university general education requirement

Elective courses (minimum of 2 credits):

- BIO 3360 - Organic Farming (4)
- BIO 3361 - Applied Organic Farming (1)
- NTR 2700 - Introduction to Food Science (3)
- NTR 2750 - Introduction to Cooking and Culinary Science (2)
- NTR 3200 - Nutrition and Physical Activity (2)
- NTR 3210 - Herbs Supplements Nutrition (2)
- NTR 3220 - Eating Disorders (2)
- NTR 3230 - Foodborne Illnesses (2)
- NTR 3260 - Food Politics (2)
- NTR 3300 - Organizational Behavior and Health Care Systems (3)

- NTR 4350 - Nutrient Metabolism (4)

Applied Health Sciences, B.S.

The Applied Health Sciences (AHS) program is designed to allow students to obtain a Bachelor of Science degree by combining courses from the university curriculum with specific Associate of Applied Sciences (AAS) degrees from accredited community colleges.

Requirements for the major in Applied Health Sciences, B.S.

1. Have already completed the course requirements for and earned the Associate of Applied Science degree in one of the following academic areas from an accredited community college or other institution of higher education:

dental assisting, health information technology, medical assistant, occupational therapy assistant, pharmacy technician, physical therapist assistant, respiratory therapy, or surgical technology. Students who hold an AAS degree in any other medical or health-related field not listed above may seek permission to enroll from the Applied Health Sciences Program Director.

2. Provide appropriate documentation of the AAS degree:

Submit official transcripts showing AAS degree and all coursework completed with a minimum 2.0 GPA. Concurrent enrollment in a community college AAS program and Oakland University's AHS program is not permitted.

3. Meet the university general education requirements

In order to graduate on-schedule without taking additional courses, it is highly recommended that students meet with an Undergraduate Academic Adviser concerning the selection of all of their general education courses.

Each candidate for an Oakland University baccalaureate will need to satisfactorily complete approved courses in each of the following areas: Foundation, Exploration, Integration, Writing, U.S. Diversity and Capstone. For details, refer to the General Education Requirements section of the catalog.

4. Complete the following courses:

- AHS 3320 - Delivering Safe Patient Care (4)
- AHS 3340 - Hospital Safety and Health (4)
- HS 2000 - Introduction to Health and Health Behaviors (3) *
- HS 4500 - Ethics in Health Care (4) *
- PH 3000 - Introduction to Public Health (3) *
- *Courses that also satisfy the university general education requirement

5. Select and complete the required courses from either the Health Care Leadership Track or Health Promotion Track

Number of elective credits required varies based on core courses completed and are selected with assistance from your academic adviser, based on your career goals, from an approved list of courses. Students must achieve a minimum of 120 credits with a minimum of 32 upper level (3000-4000) credits and satisfy all University degree requirements to graduate.

A. Health Care Leadership Track: A minimum of 20 credits of electives

- HRD 3100 - Introduction to Human Resource Development (4)
- HRD 3230 - Fundamentals of Human Interaction (4)
- HRD 3330 - Presentation and Facilitation (4)
- HRD 3510 - Principles of Leadership (4)
- HRD 3600 - Lean Principles and Practices in Organizations (4)

B. Health Promotion Track: A minimum of 20 credits of electives

- AHS 3310 - Health Care Safety (4)
- CDS 2010 - Careers in Clinical and Diagnostic Sciences (1)
- CDS 2070 - Health Care Systems Around the World (3)
- CDS 2100 - Medical Terminology (1)
- CDS 2260 - Introduction to Laboratory Theory and Techniques (2)
- CDS 3300 - Microbiology of Infectious Diseases (3)
- CDS 3310 - Microbiology of Infectious Diseases Laboratory (1)
- CDS 4000 - Medical Genetics (4)
- CDS 4010 - Human Pathology (4)
- CDS 4020 - Molecular Diagnostics (3)
- CDS 4140 - Hematology/Hemostasis I (3)
- CDS 4150 - Hematology/Hemostasis Laboratory I (1)
- CDS 4160 - Hematology/Hemostasis II (4)
- CDS 4170 - Hematology/Hemostasis Laboratory II (1)
- CDS 4230 - Medical Immunology (3)
- CDS 4240 - Immunohematology (3)
- CDS 4241 - Immunohematology Laboratory (1)

- CDS 4250 - Medical Biochemistry (4)
- CDS 4270 - Clinical Chemistry (4)
- CDS 4280 - Clinical Chemistry Laboratory (1)
- CDS 4300 - Clinical Microbiology (4)
- CDS 4320 - Medical Microbiology Laboratory (1)
- CDS 4350 - Clinical Parasitology, Mycology, Virology (3)
- CDS 4360 - Clinical Parasitology, Mycology, Virology Lab (1)
- CDS 4400 - Clinical Correlations (3)
- CDS 4900 - Special Topics (1 TO 4)
- CHM 1440 - General Chemistry I (4) * and CHM 1470 - General Chemistry Laboratory I (1)
- CHM 1450 - General Chemistry II (4) and CHM 1480 - General Chemistry Laboratory II (1)
- CHM 2340 - Organic Chemistry I (4)
- EHS 2250 - Environmental Health and Safety Training Methods (3)
- EHS 2350 - Occupational Safety and Health Standards (3)
- EHS 2450 - Professional Practice and Leadership Development (3)
- EHS 3300 - Safety and Health Administration and Programs (3)
- EHS 3330 - Fire Prevention and Protection (3)
- EHS 3380 - Environmental Health and Safety Engineering and Technology (3)
- EHS 3420 - Advanced Quantitative Methods for Environmental Health and Safety (4)
- EHS 4100 - Fundamentals of Occupational Hygiene (3)
- EHS 4200 - Applied Environmental and Occupational Hygiene (4)
- EHS 4230 - Radiation Safety (3)
- EHS 4340 - Ventilation and Emerging Technologies (4)
- EHS 4350 - Radiation Exposure Control (2)
- EHS 4410 - Accident/Incident Investigation and Analysis (3)
- EHS 4420 - Construction Safety (3)
- EHS 4430 - Robotic and Automation System Safety Analysis (3)
- EHS 4440 - Environmental Standards (3)
- EHS 4450 - Ergonomics (3)

- EHS 4460 - Industrial and Environmental Toxicology (3)
- EHS 4500 - Medical Geology (Geo-Medicine) (4)
- EXS 2200 - Introduction to Exercise Science (2)
- EXS 2700 - Safety and First Aid in Exercise Settings (2)
- EXS 3010 - Exercise Physiology (3)
- EXS 3015 - Exercise Physiology Laboratory (1)
- EXS 3020 - Biomechanics (3)
- HS 2150 - Stress Management (3)
- HS 3250 - Research Methods in Health Sciences (3)
- HS 3400 - Contemporary Topics in Health (3)
- HS 3410 - Integrative Holistic Health (3)
- HS 3430 - Sociology of Health and Medicine (4)
- HS 3440 - Introduction to Community Engagement (4)
- HS 3450 - Leadership and Healthcare (4)
- HS 3460 - Community Engaged Research Experience (4)
- HS 3500 - Health Behavior Theories (3)
- HS 4430 - Modalities for Healing (3)
- HS 4440 - Healing Traditions (3)
- HS 4450 - Laughter as Therapeutic Modality (3)
- HS 4460 - Mindfulness (3)
- HS 4550 - Qualitative Research Methods (4)
- HS 4900 - Special Topics (2 TO 4)
- HS 4995 - Directed Study (1 TO 4)
- NTR 2500 - Human Nutrition and Health (3)
- NTR 2650 - Nutrition Assessment Methods (3)
- NTR 2651 - Nutrition Assessment Methods Laboratory (1)
- NTR 2700 - Introduction to Food Science (3)
- NTR 2750 - Introduction to Cooking and Culinary Science (2)
- NTR 3120 - Community Nutrition (3)

- NTR 3140 - Food, Nutrition, and Culture (3)
- NTR 3200 - Nutrition and Physical Activity (2)
- NTR 3210 - Herbs Supplements Nutrition (2)
- NTR 3220 - Eating Disorders (2)
- NTR 3230 - Foodborne Illnesses (2)
- NTR 3260 - Food Politics (2)
- NTR 4100 - Nutrition and Lifecycles (4)
- NTR 4200 - Communication and Counseling in Nutrition Practice (4)
- NTR 4300 - Food Service Management (4)
- NTR 4350 - Nutrient Metabolism (4)
- PH 3350 - Principles of Environmental Health Sciences (4)
- PH 4650 - Social Determinants of Health (4)
- PH 4750 - Global Health and Social Issues (4)
- PHY 1010 - General Physics I (4) * and PHY 1100 - General Physics Lab I (1)
- PHY 1020 - General Physics II (4) * and PHY 1110 - General Physics Lab II (1)
- WHP 3500 - Health Program Implementation (4)
- WHP 3600 - Wellness Facilitation (4)
- WHP 3700 - Culture, Ethnicity and Well-being (3)
- WHP 3800 - Persuasion and Marketing in Health Promotion (4)
- WHP 4000 - Assessment and Interventions in Wellness (4)
- WHP 4030 - Laboratory in Assessment and Interventions (4)
- WHP 4350 - Environmental Justice (4)
- WHP 4900 - Special Topics (1 TO 4)

Environmental Health and Safety, B.S.

The Bachelor of Science in Environmental Health and Safety (EHS) degree within the Department of Public and Environmental Wellness provides a course-based and experiential education in environmental health, occupational safety and industrial hygiene concepts. This specialized discipline focuses on protecting people, property and the environment.

Students will develop expertise in identifying risks, evaluating and mitigating hazards before they cause damage or harm. Graduates of the program are prepared to become effective safety and health professionals.

The Bachelor of Science in Environmental Health and Safety is accredited by the American Board of Engineering and Technology (ABET).

Requirements for the B.S. degree with a major in Environmental Health and Safety

Students seeking the Bachelor of Science degree with a major in Environmental Health and Safety must complete a minimum of 120 credits, including the following requirements:

1. Meet the university general education requirements

In order to graduate on-schedule without taking additional courses, it is highly recommended that students meet with an Undergraduate Academic Adviser concerning the selection of all of their general education courses.

Each candidate for an Oakland University baccalaureate will need to satisfactorily complete approved courses in each of the following areas: Foundation, Exploration, Integration, Writing, U.S. Diversity and Capstone. For details, refer to the General Education Requirements section of the catalog.

2. Complete the Environmental Health and Safety required courses

- BIO 1002 - Human Biology (4) or BIO 1200 - Biology I (4)
- CHM 1040 - Introduction to Chemical Principles (4)
- CHM 2010 - Introduction to Organic and Biological Chemistry (4)
- EHS 1100 - Healthy Workplace: Protecting People and the Environment (3)*
- EHS 2250 - Environmental Health and Safety Training Methods (3)
- EHS 2350 - Occupational Safety and Health Standards (3)
- EHS 2450 - Professional Practice and Leadership Development (3)
- EHS 2550 - Basic Statistics for Health Sciences (3) * or STA 2220 - Introduction to Statistical Concepts and Reasoning (4) *
- EHS 3300 - Safety and Health Administration and Programs (3)
- EHS 3330 - Fire Prevention and Protection (3)
- EHS 3380 - Environmental Health and Safety Engineering and Technology (3)
- EHS 4100 - Fundamentals of Occupational Hygiene (3)
- EHS 4200 - Applied Environmental and Occupational Hygiene (4)
- EHS 4410 - Accident/Incident Investigation and Analysis (3)
- EHS 4420 - Construction Safety (3)

- EHS 4430 - Robotic and Automation System Safety Analysis (3)
- EHS 4440 - Environmental Standards (3)
- EHS 4450 - Ergonomics (3)
- EHS 4460 - Industrial and Environmental Toxicology (3)
- EHS 4550 - Environmental Pollution and Controls (3)
- EHS 4950 - Environmental Health and Safety Capstone Course Internship (4) (may only be taken with permission of the EHS program director)
- HS 2000 - Introduction to Health and Health Behaviors (3)
- PHY 1200 - The Physics of Everyday Life (4) * or PHY 1010 - General Physics I (4) *
- PSY 1000 - Introduction to Psychology (4) *
- MGT 1100 - Contemporary World Business (4) *
- WRT 3082 - Business Writing (4)
- *In lieu of EHS 1100 (3), students may substitute EHS 1000 (1) and EHS 1150 (2)

3. Elective credits

Minimum 14 credits

- AHS 3310 - Health Care Safety (4)
- AHS 3340 - Hospital Safety and Health (4)
- EHS 3250 - Quantitative Methods for Environmental Health and Safety (4)
- EHS 3510 - Noise Control and Measurement (2)
- EHS 4230 - Radiation Safety (3)
- EHS 4340 - Ventilation and Emerging Technologies (4)
- EHS 4350 - Radiation Exposure Control (2)
- EHS 4998 - Environmental Health and Safety Research (3)
- ENV 3540 - Global Environmental Governance (4) or PS 3730 - Global Environmental Governance (4)
- HRD 3100 - Introduction to Human Resource Development (4)
- HRD 3330 - Presentation and Facilitation (4)
- HRD 3300 - Instructional Design (4)
- HRD 3440 - Introduction to Labor and Employment Relations (4)

- HRD 3445 - Introduction to Public Sector Labor and Employment Relations (4)
- HRD 4410 - The Study of Labor and Work Organizations (4)
- HRD 4440 - Civil Rights and Regulations in Employment (4)
- HRD 3530 - Cultural Diversity in the Workplace (4)
- HRD 4300 - Instructional Methods (4)
- MGT 3000 - Survey of Management (3)
- PH 3000 - Introduction to Public Health (3) *
- PHL 1300 - Introduction to Ethics (4)
- POM 3000 - Survey of Operations Management (3)
- WRT 1050 - Composition I (4)

or any other course approved by the program director in writing through the approved petition of exception form

Grade Point Policy

Environmental Health and Safety majors must achieve minimum course grades of C in all math and science courses. Environmental Health and Safety majors and minors must achieve minimum course grades of C+ in all required EHS courses. If a student earns a final course grade below the minimum, they should meet with their academic adviser and must repeat the course in which the unsatisfactory grade was earned.

Internship

EHS students must register for EHS 4950 - Environmental Health and Safety Capstone Course Internship (4). It is highly encouraged that students complete additional internships and they are not required to register for these as long as they have registered for EHS 4950 and completed at least one.

Environmental Health and Safety, B.S. completion sequence for Certified Safety Professionals

The School of Health Sciences offers the Certified Safety Professional (CSP) an opportunity to earn a Bachelor of Science in Environmental Health and Safety (EHS) through a CSP to BS EHS completion program. The student outcomes and educational objectives established for the BS EHS program are the same for traditional and CSP students, including course objectives and teaching methodologies . Students who have satisfactorily completed a regionally accredited associate or baccalaureate degree and who possess a valid, current CSP certification may apply for admission to the CSP to BS EHS degree completion program. A cumulative GPA of C+ or better is required for admission to the CSP to BS EHS degree completion sequence. Certified safety professionals with a grade below C+ may be admitted to the University under pre-CSP EHS status and change to CSP BS EHS status upon completion of a minimum of 12 credits (applicable to the EHS program) at Oakland University with a minimum grade of C+. Certified safety professionals must complete all credits and/or courses required in the BS EHS degree program. Completion may be achieved in the following manner:

1. Graduates from a regionally accredited associate or bachelor degree program

Twenty-two (22) Environmental Health and Safety credits will be granted through a course competency process. This process includes:

- Successful completion of the CSP examination
- Evidence of a valid, current CSP certification
- Registration for competency credits as per the OU Undergraduate Catalog
- Registration for approved competency credit courses to include EHS 1100, EHS 2250, EHS 2350, EHS 3300, EHS 3380, EHS 4410, and EHS 4420

2. Students seeking a Bachelor of Science degree with a major in Environmental Health and Safety

Must complete a minimum of 120 credits as outlined in the official Oakland University catalog. The minimum required courses may be satisfied through a combination of credits delivered by Oakland University, transfer credits from regionally accredited institutions of higher education, and CSP competency credits. A minimum of 32 credits must be upper division credits from Oakland University.

Environmental Health and Safety, B.S. completion sequence for MIOSHA Training Institute Certificate holders

The Michigan Occupational Safety and Health Administration (MIOSHA) and Oakland University formed a new alliance establishing the MIOSHA Training Institute (MTI) to Bachelor of Science in Environmental Health and Safety Degree Program. This new program is available to those students who have a valid MTI Level 2 Safety and Health Management Systems (SHMS) certificate. Students who have the aforementioned certificate from MTI are eligible to receive up to 12 credits toward the Bachelor of Science in Environmental Health and Safety at Oakland University.

Students seeking a Bachelor of Science degree with a major in Environmental Health and Safety (EHS) must complete a minimum of 120 credits as outlined above. The minimum required courses may be satisfied through a combination of credits delivered by Oakland University, transfer credits from regionally accredited institutions of higher education, and MTI competency credits. A minimum of 32 credits must be upper division credits from Oakland University.

In order to receive a B.S. in EHS degree, each student must meet all the requirements of the program published in this catalog.

Courses for which are eligible for competency credit through the MTI-OU program are:

- EHS 1100 - Healthy Workplace: Protecting People and the Environment (3)
- EHS 2350 - Occupational Safety and Health Standards (3)
- EHS 3300 - Safety and Health Administration and Programs (3)
- EHS 4410 - Accident/Incident Investigation and Analysis (3) *In lieu of EHS 1100 (3), students may substitute EHS 1000 (1) and EHS 1150 (2)

Environmental Health and Safety, B.S. completion agreement for Trinidad State Junior College Associate Degree holders

The School of Health Sciences offers holders of an associate degree in Occupational Safety and Health from Trinidad State Junior College (TSJC) an opportunity to earn a Bachelor of Science in Environmental Health and Safety (EHS) through an articulation agreement. The student outcomes and educational objectives established for the BS EHS program are the same for traditional and TSJC students, including course objectives and teaching methodologies.

Students seeking a Bachelor of Science degree with a major in Environmental Health and Safety (EHS) must complete a minimum of 120 credits as outlined above. The minimum required courses may be satisfied through a combination of credits delivered by Oakland University and up to 70 transfer credits fromTrinidad State Junior College. A minimum of 32 credits must be upper division credits from Oakland University.

Students who have satisfactorily completed an Associate Degree in Occupational Health and Safety (OSH) at TSJC may apply for admission to the BS EHS degree completion program at Oakland University. These students will have the following benefits:

1. PSY 1000 - Introduction to Psychology will count in Oakland University's Social Science General Education category

2. EHS 1100 - Healthy Workplaces: Protecting People and the Environment requirement will be satisfied

3. HS 2000 - Introduction to Health and Health Behaviors will be satisfied

EHS elective credits requirement will be satisfied.

Environmental Health and Safety, B.S. to Master of Science in Safety Management (MSSM) 4+1 Dual Degree

The Environmental Health and Safety B.S. to MSSM 4+1 Plan is a combined bachelor/master degree program that provides high-achieving students an opportunity to complete a bachelor's and master's degree in less time than would be required if the two degrees were done independently. Participants can graduate with a Master of Science in Safety Management degree in approximately one calendar year after completing a B.S. in Environmental Health and Safety. Students in this program complete 10 graduate level credits at undergraduate tuition rates. Students who have a minimum overall undergraduate GPA of 3.2 and have earned a 3.0 or above GPA in each of the 10-credits of graduate courses will be reclassified as a graduate student through Graduate Study.

Requirements for the B.S. to Master of Science in Safety Management (MSSM) 4+1 Dual Degree Plan

Students seeking the B.S. to Master of Science in Safety Management (MSSM) 4+1 dual degree plan must complete a minimum 120 credits, including the following requirements:

1. Meet the university general education requirements

In order to graduate on-schedule without taking additional courses, it is highly recommended that students meet with an Undergraduate Academic Adviser concerning the selection of all of their general education courses.

Each candidate for an Oakland University baccalaureate will need to satisfactorily complete approved courses in each of the following areas: Foundation, Exploration, Integration, Writing, U.S. Diversity and Capstone. For details, refer to the General Education Requirements section of the catalog.

2. Complete the Environmental Health and Safety required credits

- BIO 1002 - Human Biology (4) or BIO 1200 - Biology I (4)
- CHM 1040 - Introduction to Chemical Principles (4)
- CHM 2010 - Introduction to Organic and Biological Chemistry (4)
- EHS 1100 - Healthy Workplace: Protecting People and the Environment (3)**
- EHS 2250 - Environmental Health and Safety Training Methods (3)
- EHS 2350 - Occupational Safety and Health Standards (3)
- EHS 2450 - Professional Practice and Leadership Development (3)
- EHS 2550 - Basic Statistics for Health Sciences (3)* or STA 2220 - Introduction to Statistical Concepts and Reasoning (4) *
- EHS 3300 - Safety and Health Administration and Programs (3)
- EHS 3330 - Fire Prevention and Protection (3)
- EHS 3380 - Environmental Health and Safety Engineering and Technology (3)
- EHS 4100 - Fundamentals of Occupational Hygiene (3)
- EHS 4200 - Applied Environmental and Occupational Hygiene (4)
- EHS 4410 - Accident/Incident Investigation and Analysis (3)
- EHS 4420 - Construction Safety (3)
- EHS 4430 - Robotic and Automation System Safety Analysis (3)
- EHS 4440 - Environmental Standards (3)
- EHS 4450 - Ergonomics (3)
- EHS 4460 - Industrial and Environmental Toxicology (3)
- EHS 4550 - Environmental Pollution and Controls (3)

- EHS 4950 - Environmental Health and Safety Capstone Course Internship (4) (may only be taken with permission of the EHS program director)
- HS 2000 - Introduction to Health and Health Behaviors (3)
- PHY 1200 - The Physics of Everyday Life (4) * or PHY 1010 - General Physics I (4) *
- PSY 1000 - Introduction to Psychology (4)
- MGT 1100 - Contemporary World Business (4) *
- WRT 3082 - Business Writing (4)

Note

Courses above with * after them also satisfy university general education requirements

**In lieu of EHS 1100 (3), students may substitute EHS 1000 (1) and EHS 1150 (2)

3. Complete a minimum of 14 credits of electives

- AHS 3310 - Health Care Safety (4)
- AHS 3340 - Hospital Safety and Health (4)
- EHS 3250 - Quantitative Methods for Environmental Health and Safety (4)
- EHS 3510 - Noise Control and Measurement (2)
- EHS 4230 - Radiation Safety (3)
- EHS 4340 - Ventilation and Emerging Technologies (4)
- EHS 4350 - Radiation Exposure Control (2)
- EHS 4998 - Environmental Health and Safety Research (3)
- ENV 3540 - Global Environmental Governance (4) or PS 3730 - Global Environmental Governance (4)
- HRD 3100 - Introduction to Human Resource Development (4)
- HRD 3300 - Instructional Design (4)
- HRD 3330 - Presentation and Facilitation (4)
- HRD 3440 - Introduction to Labor and Employment Relations (4)
- HRD 3445 - Introduction to Public Sector Labor and Employment Relations (4)
- HRD 3530 - Cultural Diversity in the Workplace (4)
- HRD 4300 - Instructional Methods (4)
- HRD 4410 - The Study of Labor and Work Organizations (4)

- HRD 4440 - Civil Rights and Regulations in Employment (4)
- MGT 3000 - Survey of Management (3)
- PH 3000 - Introduction to Public Health (3) *
- PHL 1300 - Introduction to Ethics (4)
- POM 3000 - Survey of Operations Management (3)
- WRT 1050 - Composition I (4)

*or any other course approved by the program director in writing through the approved petition of exception form

Graduate Courses:

- EHS 5200 Advanced Safety and Health Administration (3)
- EHS 5400 Risk Assessment and Loss Control (3)
- EHS 5000 Introduction to EHS Research (4)

Note

If a student has a minimum overall GPA of 3.2, has at least junior standing, the student may apply to the BS to MSSM (4+1) program through the graduate office. Qualified applicants will be given a delayed admission to the MSSM program. (Full, formal admission will not take place until the student successfully completes his or her undergraduate degree with an overall GPA of 3.2).

A student accepted into the 4+1 program continues his or her undergraduate degree with the substitution of three graduate courses as shown above.

Please note that students must be accepted into the 4+1 program before taking any graduate level courses.

If a 4+1 program student has successfully graduated with a BS degree and an overall GPA of 3.2, he or she is fully admitted to graduate MSSM program.

See graduate catalog for additional requirements for the 4+1 program.

All university and departmental requirements for the bachelor's and master's degree must be satisfied to receive both degrees. The full number of credit hours required for the bachelor's and master's degree must be completed; this includes the 10-credit of graduate courses completed as an undergraduate and approved to count towards the undergraduate and graduate degree requirements.

Wellness and Health Promotion, B.S.

The Bachelor of Science in Wellness and Health Promotion (WHP) degree program in the Department of Public and Environmental Wellness prepares students to live and promote a healthy lifestyle. These

professional skills are utilized in health enhancement, disease prevention, health education, health and fitness, corporate and worksite wellness, as well as human resource practice and management.

The WHP program offers two innovative degree pathways: the WHP to Public Health "4+1" dual degree program, and the WHP to Accelerated Second-Degree (ASD) Bachelor of Science in Nursing (BSN).

Requirements for the B.S. degree with a major in Wellness and Health Promotion

Students seeking the Bachelor of Science degree in Wellness and Health Promotion must complete a minimum 120 credits, including the following requirements:

1. Meet the university general education requirements

In order to graduate on-schedule without taking additional courses, it is highly recommended that students meet with an Undergraduate Academic Adviser concerning the selection of all of their general education courses.

Each candidate for an Oakland University baccalaureate will need to satisfactorily complete approved courses in each of the following areas: Foundation, Exploration, Integration, Writing, U.S. Diversity and Capstone. For details, refer to the General Education Requirements section of the catalog.

2. Complete the Wellness and Health Promotion core curriculum credits

- EHS 2550 - Basic Statistics for Health Sciences (3) * or STA 2220 - Introduction to Statistical Concepts and Reasoning (4) *
- MGT 1100 - Contemporary World Business (4) *(satisfies writing intensive in general education)
- EXS 2700 - Safety and First Aid in Exercise Settings (2)
- HRD 3300 - Instructional Design (4)
- HS 2000 - Introduction to Health and Health Behaviors (3) *
- HS 2150 - Stress Management (3)
- HS 3250 - Research Methods in Health Sciences (3) or PSY 2500 - Research Design in Psychology (4)
- HS 3400 - Contemporary Topics in Health (3)
- HS 4500 - Ethics in Health Care (4) or COM 3300 - Multicultural Communication (4) or PS 3215 - The Politics of Race and Ethnicity (4) or PS 3730 - Global Environmental Governance (4) (satisfies writing intensive in the major)
- NTR 2500 - Human Nutrition and Health (3)
- PSY 1000 - Introduction to Psychology (4) *
- PSY 3450 - Health Psychology (4)
- WHP 2800 - Introduction to Health Literacy (4)
- WHP 3000 - Wellness for Special Populations (4)

- WHP 3500 - Health Program Implementation (4)
- WHP 3600 - Wellness Facilitation (4)
- WHP 3800 - Persuasion and Marketing in Health Promotion (4)
- WHP 4000 - Assessment and Interventions in Wellness (4)
- WHP 4030 - Laboratory in Assessment and Interventions (4)
- WHP 4950 - Internship in Wellness and Health Promotion (4)
- WRT 1060 - Composition II (4) *

Notes

Courses above with * after them also satisfy university general education requirements.

HS 2000 is a prerequisite for HS 3250, HS 3400, WHP 3500, WHP 3600, WHP 4000, WHP 4030, WHP 4950

3. Complete 21 credit hours of electives

Electives can be chosen either from the following recommended courses or students can apply courses taken as part of a minor toward the elective requirements:

- AHS 3310 - Health Care Safety (4)
- AHS 3320 - Delivering Safe Patient Care (4)
- AHS 3340 - Hospital Safety and Health (4)
- HS 3440 - Introduction to Community Engagement (4)
- HS 3450 - Leadership and Healthcare (4)
- PH 3350 - Principles of Environmental Health Sciences (4)
- WHP 4350 - Environmental Justice (4)
- WHP 4850 - Population Health, Health Policy, and Healthcare Delivery (4)

or any course not required for the Wellness and Health Promotion degree or used to fulfill general education requirements.

Grade Point Policy

To graduate with the Wellness and Health Promotion (WHP) major a student must attain a cumulative grade point average of 2.75 in all School of Health Sciences coursework applied to the core curriculum of the major (School of Health Sciences coursework includes courses in EHS, EXS, HS, CDS, and WHP). Wellness and Health Promotion majors and minors must achieve minimum course grades of C+ in all required WHP courses. If students earn a grade below a C+, they must meet with the program coordinator to discuss their options.

Wellness and Health Promotion, B.S. to Accelerated Second Degree BSN Pathway

The School of Health Sciences (SHS) and the School of Nursing (SON) have partnered to create the Wellness and Health Promotion (WHP) to Accelerated Second-Degree (ASD) Bachelor of Science in Nursing (BSN) pathway. This pathway is for first-time Pre-Nursing freshman students who did not gain admission to the Basic BSN program after their first year of study. Up to five pre-nursing students will be offered automatic admission to the ASD program through the WHP-ASD pathway. Students on the WHP-ASD pathway must meet all of the following requirements to gain admission into the SON's ASD BSN track in the semester following degree attainment:

1. Completion of all nursing prerequisites in the first year of study with a minimum grade of Bin each course and with no repeated coursework. These courses include BIO 1200, BIO 2006, CHM 1040, CHM 2010, PSY 1000, PHY 1100 (1000 or 1300 also accepted), and WRT 1060.

2. A combined grade point average of 3.2 or higher in BIO 1200, BIO 2006, CHM 1040, CHM 2010, and PSY 1000.

3. Completion of the B.S. in WHP with a 3.0 cumulative grade point average or higher.

4. No repeated courses in the B.S. in WHP.

5. Completion of CDS 3300 and CDS 3310 or BIO 3520, with a minimum grade of C.

6. Completion of PSY 2250 with a minimum grade of B-.

7. Adherence to Oakland University's undergraduate admission requirements for second-degree students, including the completion of a second-degree application through Undergraduate Admissions.

Wellness and Health Promotion, B.S. to Master of Public Health (MPH) 4+1 Dual Degree Plan

The Wellness and Health Promotion B.S. to MPH 4+1 Plan is a combined bachelor/master degree program that provides high-achieving students an opportunity to complete a bachelor's and master's degree in less time than would be required if the two degrees were done independently. Participants can graduate with a Master of Public Health degree in approximately one calendar year after completing a B.S. in Wellness and Health Promotion. Students in this program complete 12 graduate level credits at undergraduate tuition rates. Students who have a minimum overall undergraduate GPA of 3.2 and have earned a 3.0 or above GPA in each of the 12-credits of graduate courses will be reclassified as a graduate student through Graduate Study.

Requirements for the B.S. to Master of Public Health (MPH) 4+1 Dual Degree Plan

Students seeking the B.S. to Master of Public Health (MPH) 4+1 dual degree plan must complete a minimum 120 credits, including the following requirements:

1. Meet the university general education requirements

In order to graduate on-schedule without taking additional courses, it is highly recommended that students meet with an Undergraduate Academic Adviser concerning the selection of all of their general education courses.

Each candidate for an Oakland University baccalaureate will need to satisfactorily complete approved courses in each of the following areas: Foundation, Exploration, Integration, Writing, U.S. Diversity and Capstone. For details, refer to the General Education Requirements section of the catalog.

2. Complete the Wellness and Health Promotion core curriculum credits

- EHS 2550 - Basic Statistics for Health Sciences (3) * or STA 2220 - Introduction to Statistical Concepts and Reasoning (4)
- MGT 1100 - Contemporary World Business (4) *(satisfies writing intensive in general education)
- EXS 2700 - Safety and First Aid in Exercise Settings (2)
- HRD 3300 - Instructional Design (4)
- HS 2000 - Introduction to Health and Health Behaviors (3)
- HS 2150 - Stress Management (3)
- HS 3250 - Research Methods in Health Sciences (3)
- HS 3400 - Contemporary Topics in Health (3)
- HS 4500 - Ethics in Health Care (4) or COM 3300 - Multicultural Communication (4) or PS 3215 - The Politics of Race and Ethnicity (4) or PS 3730 - Global Environmental Governance (4) (satisfies writing intensive in the major)
- NTR 2500 - Human Nutrition and Health (3)
- PSY 1000 - Introduction to Psychology (4)
- PSY 3450 - Health Psychology (4)
- WHP 2800 - Introduction to Health Literacy (4)
- WHP 3000 - Wellness for Special Populations (4)
- WHP 3500 - Health Program Implementation (4)
- WHP 3600 - Wellness Facilitation (4)
- WHP 3800 - Persuasion and Marketing in Health Promotion (4)
- WHP 4000 - Assessment and Interventions in Wellness (4)

- WHP 4030 - Laboratory in Assessment and Interventions (4)
- WHP 4950 - Internship in Wellness and Health Promotion (4)
- WRT 1060 - Composition II (4)

Note

Courses above with * after them also satisfy university general education requirements.

HS 2000 is a prerequisite for HS 3250, HS 3400, WHP 3500, WHP 3600, WHP 4000, WHP 4030, WHP 4950

Complete a minimum of 8 credits of electives

Students may choose electives from the following recommended course list or apply courses taken as part of a minor toward the elective requirements:

- AHS 3310 - Health Care Safety (4)
- AHS 3320 - Delivering Safe Patient Care (4)
- AHS 3340 - Hospital Safety and Health (4)
- PSY 2500 - Research Design in Psychology (4)
- WHP 3250 - Issues in Women's Health (4)
- WHP 4350 - Environmental Justice (4)
- WHP 4850 - Population Health, Health Policy, and Healthcare Delivery (4)
- Any 1000 or 2000 level course in EXS not listed above
- Any 1000, 2000 or 3000 level course in HS not listed above
- Any 1000 or 2000 level course in EHS not listed above or any course not required for the Wellness and Health Promotion degree or used to fulfill general education requirements.

Graduate Courses:

- PH 5000 Foundations of Health Behavior and Health Education (4)
- PH 5100 Principles of Community-Based Participatory Research (4)
- PH 5200 Planning, Implementation, and Evaluation of Public Health Interventions (4)

Note

If a student has a minimum overall GPA of 3.2, has at least sophomore standing, and has completed: EHS 2550 (or STA 2220); HS 3250 (or PSY 2500); WHP 2800; and WHP 3500, the student may apply to the BS to MPH (4+1) program through the graduate office. Qualified applicants will be given a delayed admission to the MPH program. (Full, formal admission will not take place until the student successfully completes his or her undergraduate degree with an overall GPA of 3.0). Applications are due February 1.

A student accepted into the 4+1 program continues his or her undergraduate degree with the substitution of three graduate courses as shown above.

Please note that students must be accepted into the 4+1 program before taking any graduate level courses.

If a 4+1 program student has successfully graduated with a BS degree and an overall GPA of 3.0, they are fully admitted to the graduate MPH program.

See graduate catalog for additional requirements for the 4+1 program.

All university and departmental requirements for each bachelor's degree and master's degree must be satisfied to receive both degrees. The full number of credit hours required for the bachelor's and master's degree must be completed; this includes the 12-credit of graduate courses completed as an undergraduate and approved to count towards the undergraduate and graduate degree requirements.

Environmental Health and Safety Minor

A minor in Environmental Health and Safety is available to complement other majors in the School of Health Sciences and in other programs, such as human resource development, engineering, biology or chemistry. A minimum of 24 credit hours is required for a minor in Environmental Health and Safety.

Requirements for the environmental health and safety minor

- EHS 1100 - Healthy Workplace: Protecting People and the Environment (3)
- EHS 2250 - Environmental Health and Safety Training Methods (3)
- EHS 2350 - Occupational Safety and Health Standards (3)
- EHS 3300 - Safety and Health Administration and Programs (3)
- EHS 3380 - Environmental Health and Safety Engineering and Technology (3)
- EHS 4100 - Fundamentals of Occupational Hygiene (3)
- EHS 4410 - Accident/Incident Investigation and Analysis (3)
- EHS 4440 - Environmental Standards (3)

*In lieu of EHS 1100 (3), students may substitute EHS 1000 (1) and EHS 1150 (2)

Grade point policy

Environmental Health and Safety minors must achieve minimum course grades of C+ in all required EHS courses. If a student earns a final course grade below the minimum, they should meet with their academic adviser and must repeat the course in which the unsatisfactory grade was earned.

Wellness and Health Promotion Minor

A minor of 20 credit hours in Wellness and Health Promotion is available to students majoring in other programs across the University.

The following courses are required for the minor in Wellness and Health Promotion

- WHP 2800 - Introduction to Health Literacy (4)
- WHP 3500 - Health Program Implementation (4)
- WHP 3800 - Persuasion and Marketing in Health Promotion (4)
- WHP 4000 - Assessment and Interventions in Wellness (4)
- WHP 4030 - Laboratory in Assessment and Interventions (4)

Note

HS 2000 is a prerequisite for WHP 3500, WHP 4000 and WHP 4030.

ECLIPSE - Explorations in Collaborative Leadership and InterProfessional Education Program

The Explorations in Collaborative Leadership and InterProfessional Education (ECLIPSE) program at Oakland University is a novel leadership model designed to foster students' abilities to become leaders within and beyond our communities through diverse, student-centered, collaborative, and interprofessional experiences. The ECLIPSE program offers collaborative leadership and interprofessional education experiences in all majors within the SHS. Students engaged in the program develop the competencies of interprofessional education (communication, values, roles/responsibilities, and teamwork) through: 1) participation in ECLIPSE workshops; 2) reflections on interprofessional experiences in and outside of academic courses; 3) peer mentorship; and 4) a culminating community impact project. As students participate in ECLIPSE activities, mentoring, and other collaborative leadership experiences on and off campus, they submit reflections detailing the knowledge and skills gained through their experiences. Students complete an e-portfolio, documenting their leadership experiences and personal growth over the course of their education at Oakland University.

Requirements to participate in ECLIPSE

Students interested in participating in ECLIPSE must have declared a School of Health Sciences major. Students can become involved in ECLIPSE at any time; however, those nearing the end of their degree should consult with the ECLIPSE Coordinator.

ECLIPSE core curriculum courses

- IPE 1000 - ECLIPSE I (0)
- IPE 1010 - ECLIPSE I A (0)
- IPE 2000 - ECLIPSE II (0)
- IPE 2010 - ECLIPSE II A (0)
- IPE 3000 - ECLIPSE III (0)
- IPE 3010 - ECLIPSE III A (0)
- IPE 4000 - ECLIPSE IV (0)
- IPE 4010 - ECLIPSE IV A (0)
- IPE 4500 - InterProfessional Education (3)
- IPE 4900 - Special Topics (0)

School of Business Administration (SBA)

Business Administration, Accounting Major, B.S.

Requirements for the major in accounting, B.S.

The accounting faculty has adopted the statement of mission as defined in the School of Business Administration Mission Statement. Within the context of that mission statement, the accounting curriculum is intended to prepare graduates for careers in public accounting, industry and government.

To fulfill requirements for the accounting major, students must be admitted to major standing in accounting, complete the core program and earn a minimum of 32 credits in the courses specified below, with a grade of C or better in each major course. A grade of C or better must be achieved in each prerequisite course before an Oakland University student may begin work in a subsequent accounting course.

Required pre-core courses -- 8 credits

- ACC 2000 - Financial Accounting (4)
- ACC 2100 - Managerial and Cost Accounting I (4)

Required major courses -- 12 credits

- ACC 4001 - Intermediate Financial Accounting I (3)
- ACC 4002 - Intermediate Financial Accounting II (3)
- ACC 4003 - Managerial and Cost Accounting II (3)
- ACC 4180 - Accounting Information Systems: Planning and Analysis (3) or ACC 5180 - Accounting Information Systems: Planning and Analysis (3)
- ACC 3990 - ACHIEVE III - Accounting (0)

Electives - choose 12 credits

- ACC 4150 - Introduction to Taxation (3) or ACC 5150 - Federal Income Taxation (3)
- ACC 4220 - Auditing (3) or ACC 5220 - Auditing (3)
- ACC 4240 - Government and Not-for-Profit Accounting (3) or ACC 5240 - Government and Not-for-Profit Accounting (3)
- ACC 4310 - Advanced Financial Accounting (3) or ACC 5310 - Advanced Financial Accounting (3)
- ACC 4900 - Special Topics in Accounting (3)
- ACC 4996 - Independent Study (1 TO 3)
- ACC 5050 Business Law for Accountants (3)
- ACC 5210 Federal Income Tax II (3)
- ACC 5260 Account Information Systems: Audit & Control (3)
- ACC 5500 Tax Research and Procedures (3)

32 total credits

Note

The 5000-level accounting courses are open to undergraduate accounting majors during their senior year with the permission of the Faculty Director of Accounting Programs. Students who have taken ACC 5180 under a previous catalog will be able to count this course as a required course. Students who have taken ACC 5050, ACC 5150, ACC 5210, ACC 5220, ACC 5240, ACC 5260, ACC 5310, or ACC 5500 under a previous catalog will be able to count the course as an elective.

Because of specific examination requirements, students who plan to take a professional accounting examination (CPA, CMA or CIA) should discuss their options with a faculty major adviser before enrolling in 4000-level accounting courses. The Master of Accounting degree program provides for 30 credits of accounting and related course-work. Undergraduate students will be able to apply to the program during the fourth year of their undergraduate program. With the completion of 154 credits of undergraduate and graduate course-work, students will graduate with a Bachelor of Science with a major in accounting and a Master of Accounting. Students are encouraged to seek advising from the Faculty Director of Accounting Programs if they are considering this option.

Students planning to sit for the CPA Examination should be aware that the State of Michigan (and most other states) requires a minimum of 150 credit hours to become a Certified Public Accountant. The requirement will be satisfied by completing the Master of Accounting degree program. While the MAcc program is recommended, additional undergraduate courses may also satisfy the 150-credit hour requirement. The Faculty Director of Accounting Programs can help you evaluate different options for your situation.

Accounting Minor

The minor in accounting consists of a minimum of the following two courses and any prerequisites for these courses: ACC 2000, ACC 2100 and four additional courses in any 3000- or 4000-level accounting (ACC) courses. The minimum grade of C must be earned in each course in the accounting minor and in the prerequisites for each course. This minor is open to all students except accounting majors.

Business Administration, Finance Major, B.S.

Requirements for business administration, finance, B.S.

The major in finance leads to an understanding of the theoretical foundations of finance and develops the specific skills, modes of analysis and institutional background useful to work in the finance areas of profit-making businesses or not-for- profit enterprises.

To fulfill requirements for the finance major, students must be admitted to major standing in finance, complete the core program and earn a minimum of 25 credits, as specified below, with a grade of C or better in each major course. A grade of C or better must be achieved in FIN 3220 and in each prerequisite for a finance course before a finance major, or any Oakland University student, may begin work in that finance course.

Students who have taken FIN 3680, FIN 4250, FIN 4360, FIN 4300, ACC 4003 or ACC 4150 under a previous catalog will be able to count these courses as electives.

Required in the core -- 3 credits

- FIN 3220 - Managerial Finance I (3)

Required major courses -- 12 credits

- ACC 3010 - Financial Reporting and Analysis (3) *
- FIN 3600 - Investment Analysis (3)
- FIN 3680 - Financial Modeling (3)
- FIN 3720 - Managerial Finance II (3)
- FIN 3990 - ACHIEVE III - Finance (0)

*In lieu of ACC 3010 (3), students may substitute both (ACC 3100 (3), and ACC 3110 (3)) or ACC 4001 (3) and ACC 4002 (3))

Electives -- choose three courses from the following (some may require additional prerequisites) ** -- 9 credits

- FIN 4180 - Financial Markets and Institutions (3)
- FIN 4190 - International Financial Management (3)
- FIN 4200 - Real Estate Investment Analysis (3)
- FIN 4250 - Financial Derivatives (3)
- FIN 4300 - Mergers and Acquisitions and Corporate Restructuring (3)
- FIN 4360 - Managing Investment Funds (3)
- FIN 4600 - Investment Portfolio Management (3)
- FIN 4900 - Special Topics in Finance (3)

**(ACC 3200 (3) or ACC 4003 (3)) or (ACC 3500 (3) or ACC 4150 (3)) may be substituted for one finance elective.

24 total credits

Requirements for business administration, finance, B.S., specialization in wealth management

Required in the core - 3 credits

- FIN 3220 - Managerial Finance I (3)

Required major courses - 15 credits

- ACC 3010 - Financial Reporting and Analysis (3) *
- ACC 4150 - Introduction to Taxation (3)
- FIN 3600 - Investment Analysis (3)
- FIN 3680 - Financial Modeling (3)
- FIN 3720 - Managerial Finance II (3)
- FIN 3990 - ACHIEVE III - Finance (0)

*In lieu of ACC 3010 (3), students may substitute (ACC 3100 (3), and ACC 3110 (3)) or (ACC 4001 (3) and ACC 4002 (3))

Electives - 3 credits - choose 1 elective

- FIN 4180 - Financial Markets and Institutions (3)
- FIN 4250 - Financial Derivatives (3)
- FIN 4360 - Managing Investment Funds (3)
- FIN 4600 - Investment Portfolio Management (3)
- FIN 4900 - Special Topics in Finance (3)

Required capstone course - 3 credits

- FIN 4779 - Estate, Retirement, and Education Planning (3)

Note

If an Actuarial Science student wants to switch to a Finance major, they can use FIN 3550 to satisfy the FIN 3220 requirement, but will still need to take FIN 3720. If a Finance major student wants to switch to an Actuarial Science major, they will need to use both FIN 3220 and FIN 3720 to satisfy the FIN 3550 requirement.

Students who have taken FIN 3680 and are on a previous catalog, can count this as a required major course.

Business Administration, Finance Major, B.S., Specialization in Wealth Management

Requirements for business administration, finance, B.S., specialization in wealth management

1. Required in the core - 3 credits

- FIN 3220 - Managerial Finance I (3)

2. Required major courses - 15 credits

- ACC 3010 - Financial Reporting and Analysis (3)
- ACC 4150 - Introduction to Taxation (3)
- FIN 3600 - Investment Analysis (3)
- FIN 3680 - Financial Modeling (3)
- FIN 3720 - Managerial Finance II (3)
- FIN 3990 - ACHIEVE III - Finance (0)

+ in lieu of ACC 3010 (3), students may substitute (ACC 3100 (3) and ACC 3110 (3)) or (ACC 4001 (3) and ACC 4002 (3))

3. Electives - 3 credits - choose 1 elective

- FIN 4180 - Financial Markets and Institutions (3)
- FIN 4250 - Financial Derivatives (3)
- FIN 4360 - Managing Investment Funds (3)
- FIN 4600 - Investment Portfolio Management (3)
- FIN 4900 - Special Topics in Finance (3)

4. Required capstone course - 3 credits

- FIN 4779 - Estate, Retirement, and Education Planning (3)

Note

If an Actuarial Science student wants to switch to a Finance major, they can use FIN 3550 to satisfy the FIN 3220 requirement, but will still need to take FIN 3720. If a Finance major student wants to switch to an Actuarial Science major, they will need to use both FIN 3220 and FIN 3720 to satisfy the FIN 3550 requirement.

Students who have taken FIN 3680 and are on a previous catalog, can count this as a required major course.

Finance Minor

The minor in finance consists of a minimum of four courses including FIN 3220 or FIN 3550 and three courses in 3000 or 4000 level finance (FIN) courses and any prerequisites for these courses (either ACC 3010 or ACC 4003 or ACC 4150 may satisfy three credits toward the finance minor). The prerequisites for the finance courses normally require up to seven courses including (MTH 1221 and MTH 1222) or (MTH 1441 and MTH 1554), ACC 2000 and ACC 2100, [ECN 2010 and (ECN 2020 or ECN 2000)], QMM 2400 and QMM 2410 (or STA 2220 and/or STA 2226). A minimum grade of C must be earned in each course in the finance minor and in the prerequisites for each course. This minor is open to all students except finance majors.

Students on a previous catalog who have taken FIN 3550 will be able to count this course toward the Finance Minor.

Students who place into MTH 1222 or MTH 1554, or transfer MTH 1222 or MTH 1554, are waived from MTH 1221 or MTH 1441.

Business Administration, Management Information Systems Major, B.S.

Management Information Systems (MIS) is about applying information technology to business problems. The emphasis is on finding solutions. To the MIS professional, information technology is a tool, not an end in itself. MIS is concerned with using information and communication technologies to support management at all levels (supervisory, middle, top) and in all business functional areas (accounting, finance, marketing, human resources, and operations management) with the information they need for planning, control, and decision making. In addition to computer technology, MIS considers how managers and knowledge workers actually use information and how system specialists and end users interact during the analysis, design, implementation, and on-going use of information systems. MIS experts attempt to bridge the gap between information technology and people's needs. A related field is Computer Science. The two majors differ in that Computer Science emphasizes the theoretical side of hardware and system software, whereas MIS emphasizes application software development and the business context in which an information system exists.

Requirements for the major in management information systems, B.S.

To fulfill the requirements for the major in management information systems, students must be admitted to major standing in management information systems, complete the core program and complete at least 27 credits, as specified below, with a grade of C or better in each major course. A grade of C or better must be achieved in each prerequisite for an MIS course before an MIS major, or any Oakland University student, may begin work in that MIS course.

Note

Below are specific major requirements that must be completed in addition to the Requirements for Business Administration Majors (follow link to view additional requirements).

Required in the pre-core and core -- 6 credits

- MIS 1000 - Business Problem Solving with Information Technology (3)
- MIS 3000 - Management Information Systems (3)

Required major courses -- 12 credits

- MIS 3050 - Information Technology Foundations (3)
- MIS 3140 - Business Database Systems (3)
- MIS 3990 - ACHIEVE III - Management Information Systems (0)
- MIS 4050 - Business Systems Analysis and Design (3) or MIS 5150 Systems Analysis and Design (3)
- MIS 4060 - Managing Information Projects (3) or MIS 5160 Software Program and Project Management (3)

Electives -- choose three courses -- 9 credits

- MIS 4130 - Networks (3)
- MIS 4140 - Information Security Lab (3)
- MIS 4170 - Practical Cyber Security Fundamentals (3) or MIS 5170 Practical Cyber Security Fundamentals (3)
- MIS 4180 - IS Risk Analysis and Security Controls Development (3) or MIS 5180 IS Risk Analysis and Security Controls Development (3)
- MIS 4200 - Electronic Commerce (3)
- MIS 4220 - Business Object Development (3)
- MIS 4240 - Business Application Architecture (3)
- MIS 4260 - Business Application Technology (3)
- MIS 4410 - Operations Analytics (3)

- MIS 4460 - Business Analytics (3) or MIS 5460 Business Analytics (3)
- MIS 4470 - Practical Computing for Data Analytics (3)
- MIS 4500 - Web Analytics (3)
- MIS 4560 - Introduction to Data Science (3) or MIS 5560 Introduction to Data Science (3)
- MIS 4700 - IS Security (3)
- MIS 4750 - Mobile Security and Secure Application Development (3)
- MIS 4900 - Special Topics in MIS (3)
- MIS 5630 - Networks (3)1
- MIS 5640 - Network Management (3)1

Note

The 5000-level MIS courses are open to undergraduate students with the permission of the Faculty Coordinator for the Master of Science in Information Technology Management (MSITM) Program. For students pursuing the MSITM Program, MIS 5150 can substitute for MIS 4050, MIS 5160 can substitute MIS 4060, and two of the following graduate elective courses can substitute as undergraduate elective courses for the MIS Program - MIS 5460, MIS 5560, MIS 5170, and MIS 5180.

Students who have taken MIS 4140, MIS 4170, MIS 4180, MIS 4410, MIS 4460, MIS 4470, MIS 4500, MIS 4560, MIS 4700, MIS 4750, MIS5170, MIS5180, MIS5460, MIS5630, MIS5560, or MIS5640 under a previous catalog can count these courses as an elective. Students who have taken MIS5150 or MIS5160 under a previous catalog can count these courses as required courses.

27 total credits

Business Analytics (BA) Specialization

Minimum of 27 Credits

Business analytics involves a diverse, yet complementary, set of quantitative techniques and information technologies for supporting managerial decision making in business. Analytics includes creative use of large (and not so large) datasets, statistical analysis, data visualization, predictive analytics, simulation, data preparation and cleaning, data warehousing and business intelligence. The successful business analytics professional combines technical knowledge and skills with business domain knowledge and strong communication skills to generate business insights and support managerial decision making at all levels of the organization.

Note

Below are specific major requirements that must be completed in addition to the Requirements for Business Administration Majors (follow link to view additional requirements).

Required in the pre-core and core - 6 credits

- MIS 1000 - Business Problem Solving with Information Technology (3)
- MIS 3000 - Management Information Systems (3)

Required major courses - 12 credits

- MIS 3050 - Information Technology Foundations (3)
- MIS 3140 - Business Database Systems (3)
- MIS 3990 - ACHIEVE III - Management Information Systems (0)
- MIS 4050 - Business Systems Analysis and Design (3) or MIS 5150 Systems Analysis and Design (3)
- MIS 4060 - Managing Information Projects (3) or MIS 5160 Software Program and Project Management (3)

Required for BA Specialization - 6 credits

- MIS 4460 - Business Analytics (3) or MIS 5460 Business Analytics (3)

and

- MIS 4560 - Introduction to Data Science (3) or MIS 5560 Introduction to Data Science (3)

or

- MIS 4470 - Practical Computing for Data Analytics (3) or MIS 5470 Practical Computing for Data Analytics

*Students are recommended to take both MIS 4560 and MIS 4470. If students take both of these courses, one of them will be counted towards the elective.

Students on a previous catalog can use MIS 4470, MIS 5460, MIS 5150, MIS 5160, MIS 5470, or MIS 5560 as a required course for the BA Specialization.

Electives - 3 credits

Choose one (1) from the following list of electives:

- MIS 4410 - Operations Analytics (3)
- MIS 4500 - Web Analytics (3)
- MIS 4560 - Introduction to Data Science (3) or MIS 5560 - Introduction to Data Science (3)

or

- MIS 4470 - Practical Computing for Data Analytics (3) or MIS 5470 - Practical Computing for Data Science (3)
- MIS 4900 - Special Topics in MIS (3) (with Specialization Advisor's approval)
- QMM 4400 - Management Science (3)
- QMM 4520 - Forecasting (3)

*Students are recommended to take both MIS 4560 and MIS 4470. If students take both of these courses, one of them will be counted toward a required course and one of them will be counted toward an elective course.

Students on a previous catalog can count QMM4520 or MIS4900 as elective courses for the BA Specialization.

Note

The 5000-level MIS courses are open to undergraduate students with the permission of the Faculty Coordinator for the Master of Science in Information Technology Management (MSITM) Program. For students pursuing the MSITM Program, MIS5150 can substitute for MIS4050, MIS5160 can substitute for MIS4060, and two graduate electives can substitute as undergraduate required courses for the BA Specialization - MIS5460 and MIS5560

Information Security Management (ISM) Specialization

Minimum of 27 Credits

Specialization Adviser: Xiaodong Deng

The increased number of information security breaches or ever sophisticated cybercrimes make information systems security a fast-growing field creating a huge demand for security professionals to protect organizations' information assets including intellectual property, competitive intelligence, business transaction records, and other strategic, tactical, and operational data. The objective of

informant security management specialization is to provide complementary knowledge and skills to MIS students to manage the confidentiality, integrity, and availability (CIA) of an organization's information assets.

Note

Below are specific major requirements that must be completed in addition to the Requirements for Business Administration Majors (follow link to view additional requirements).

Required in the pre-core and core - 6 credits

- MIS 1000 - Business Problem Solving with Information Technology (3)
- MIS 3000 - Management Information Systems (3)

Required major courses - 12 credits

- MIS 3050 - Information Technology Foundations (3)
- MIS 3140 - Business Database Systems (3)
- MIS 3990 - ACHIEVE III - Management Information Systems (0)
- MIS 4050 - Business Systems Analysis and Design (3) or MIS 5150 Systems Analysis and Design (3)
- MIS 4060 - Managing Information Projects (3) or MIS 5160 Software Program and Project Management (3)

Required for ISM Specialization - 6 credits

- MIS 4170 - Practical Cyber Security Fundamentals (3) or MIS 5170 - Practical Cyber Security Fundamentals (3)
- MIS 4180 - IS Risk Analysis and Security Controls Development (3) or MIS 5180 - IS Risk Analysis and Security Controls Development (3)

Electives - 3 credits

Choose one (1) from the following list of electives:

- MIS 4130 - Networks (3)
- MIS 4140 - Information Security Lab (3)
- MIS 4700 - IS Security (3)

- MIS 4750 - Mobile Security and Secure Application Development (3)
- MIS 4900 - Special Topics in MIS (3) (with Specialization Advisor's approval)

Students who have taken MIS 4170, MIS 5150, MIS 5160, MIS 5170, MIS 5180, or MIS 4900 under a previous catalog will be able to count this as a required course for the ISM Specialization.

Note

The 5000-level MIS courses are open to undergraduate students with the permission of the Faculty Coordinator for the Master of Science in Information Technology Management (MSITM) Program. For students pursuing the MSITM Program, MIS 5150 can substitute for MIS 4050, MIS 5160 can substitute for MIS 4060, and two graduate electives can substitute as undergraduate required courses for the ISM Specialization - MIS 5170 and MIS 5180.

Business Administration, Management Information Systems Major, B.S., Specialization in Business Analytics

Minimum of 27 Credits

Business analytics involves a diverse, yet complementary, set of quantitative techniques and information technologies for supporting managerial decision making in business. Analytics includes creative use of large (and not so large) datasets, statistical analysis, data visualization, predictive analytics, simulation, data preparation and cleaning, data warehousing and business intelligence. The successful business analytics professional combines technical knowledge and skills with business domain knowledge and strong communication skills to generate business insights and support managerial decision making at all levels of the organization.

Note

Below are specific major requirements that must be completed in addition to the Requirements for Business Administration Majors (follow link to view additional requirements).

Required in the pre-core and core - 6 credits

- MIS 1000 - Business Problem Solving with Information Technology (3)
- MIS 3000 - Management Information Systems (3)

Required major courses - 12 credits

- MIS 3050 - Information Technology Foundations (3)
- MIS 3140 - Business Database Systems (3)
- MIS 3990 - ACHIEVE III - Management Information Systems (0)
- MIS 4050 - Business Systems Analysis and Design (3) or MIS 5150 Systems Analysis and Design (3)
- MIS 4060 - Managing Information Projects (3) or MIS 5160 Software Program and Project Management (3)

Required for BA Specialization - 6 credits

- MIS 4460 - Business Analytics (3) or MIS 5460 Business Analytics (3)

and

- MIS 4560 - Introduction to Data Science (3) or MIS 5560 Introduction to Data Science (3)

or

- MIS 4470 - Practical Computing for Data Analytics (3) or MIS 5470 Practical Computing for Data Analytics

*Students are recommended to take both MIS 4560 and MIS 4470. If students take both of these courses, one of them will be counted towards the elective.

Students on a previous catalog can use MIS 4470, MIS 5460, MIS 5150, MIS 5160, MIS 5470, or MIS 5560 as a required course for the BA Specialization.

Electives - 3 credits

Choose one (1) from the following list of electives:

- MIS 4410 - Operations Analytics (3)
- MIS 4500 - Web Analytics (3)
- MIS 4560 - Introduction to Data Science (3) or MIS 5560 - Introduction to Data Science (3)

or

- MIS 4470 - Practical Computing for Data Analytics (3) or MIS 5470 - Practical Computing for Data Science (3)
- MIS 4900 - Special Topics in MIS (3) (with Specialization Advisor's approval)
- QMM 4400 - Management Science (3)
- QMM 4520 - Forecasting (3)

*Students are recommended to take both MIS 4560 and MIS 4470. If students take both of these courses, one of them will be counted toward a required course and one of them will be counted toward an elective course.

Students on a previous catalog can count QMM4520 or MIS4900 as elective courses for the BA Specialization.

Note

The 5000-level MIS courses are open to undergraduate students with the permission of the Faculty Coordinator for the Master of Science in Information Technology Management (MSITM) Program. For students pursuing the MSITM Program, MIS5150 can substitute for MIS4050, MIS5160 can substitute for MIS4060, and two graduate electives can substitute as undergraduate required courses for the BA Specialization - MIS5460 and MIS5560.

Business Administration, Management Information Systems Major, B.S., Specialization in Information Security Management

The increased number of information security breaches or ever sophisticated cybercrimes make information systems security a fast-growing field creating a huge demand for security professionals to protect organizations' information assets including intellectual property, competitive intelligence, business transaction records, and other strategic, tactical, and operational data. The objective of informant security management specialization is to provide complementary knowledge and skills to MIS students to manage the confidentiality, integrity, and availability (CIA) of an organization's information assets.

Note

Below are specific major requirements that must be completed in addition to the Requirements for Business Administration Majors (follow link to view additional requirements).

Required in the pre-core and core - 6 credits

- MIS 1000 - Business Problem Solving with Information Technology (3)
- MIS 3000 - Management Information Systems (3)

Required major courses - 12 credits

- MIS 3050 - Information Technology Foundations (3)
- MIS 3140 - Business Database Systems (3)
- MIS 3990 - ACHIEVE III - Management Information Systems (0)
- MIS 4050 - Business Systems Analysis and Design (3) or MIS 5150 Systems Analysis and Design (3)
- MIS 4060 - Managing Information Projects (3) or MIS 5160 Software Program and Project Management (3)

Required for ISM Specialization - 6 credits

- MIS 4170 - Practical Cyber Security Fundamentals (3) or MIS 5170 - Practical Cyber Security Fundamentals (3)
- MIS 4180 - IS Risk Analysis and Security Controls Development (3) or MIS 5180 - IS Risk Analysis and Security Controls Development (3)

Electives - 3 credits

Choose one (1) from the following list of electives:

- MIS 4130 - Networks (3)
- MIS 4140 - Information Security Lab (3)
- MIS 4700 - IS Security (3)
- MIS 4750 - Mobile Security and Secure Application Development (3)
- MIS 4900 - Special Topics in MIS (3) (with Specialization Advisor's approval)

Students who have taken MIS 4170, MIS 5150, MIS 5160, MIS 5170, MIS 5180, or MIS 4900 under a previous catalog will be able to count this as a required course for the ISM Specialization.

Note

The 5000-level MIS courses are open to undergraduate students with the permission of the Faculty Coordinator for the Master of Science in Information Technology Management (MSITM) Program. For students pursuing the MSITM Program, MIS 5150 can substitute for MIS 4050, MIS 5160 can substitute for MIS 4060, and two graduate electives can substitute as undergraduate required courses for the ISM Specialization - MIS 5170 and MIS 5180.

MSITM 4+1 Program

The MSITM 4+1 Program is a combined bachelor/master degree program that provides high-achieving students an opportunity to complete a bachelor's and master's degree in less time than would be required if the two degrees were done independently. It is designed for students who are high academic achievers and creates an integrated learning experience along several knowledge paths. The MSITM 4+1 Program students will be able to earn their master's degree by completing 18 credits (6 courses instead of 10) beyond the undergraduate MIS major requirements.

Students accepted for the MSITM 4+1 Program must have a minimum overall undergraduate GPA of 3.2. Students may apply to the MSITM 4+1 Program and be offered deferred admission to the graduate program during their junior year. 4 + 1 MSITM applicants may request to waive the GMAT requirement. To be eligible for the waiver, applicants must have a cumulative GPA of 3.0 or higher. To request a waiver, download, complete, and submit the Request to Waive GMAT Form. This form is found under Supplemental Application, School of Business Administration.

It is important that students register for the 5000-level classes that are double counted in order to satisfy the electives requirement for the MIS major as well as get credit towards the MSITM program. If students take only the 4000-level electives, those courses cannot be counted for the MSITM degree.

Students offered deferred admission will remain classified as undergraduates until they have completed all undergraduate degree requirements. At that time, students who have maintained an overall undergraduate GPA 3.2 and have earned a 3.0 or above GPA in the double-counted graduate courses, will be reclassified as a graduate student through Graduate Study.

Please refer to the Graduate Catalog for the recommended Schedule and Course Options for the MSITM 4+1 Program

Business Administration, Operations Management Major, B.S., Specialization in Lean and Quality Management

Minimum of 22 Credits

This specialization focuses on the complementary and interdependent subjects of Lean and Quality Management. This specialization examines strategies pursued in order to attain objectives including productivity enhancement, waste reduction, and quality improvements. The set of courses comprising this specialization emphasize organizational efforts toward a customer-driven philosophy for organization-wide continuous improvement efforts.

Note

Below are specific major requirements that must be completed in addition to the Requirements for Business Administration Majors (follow link to view additional requirements).

Required for OM Major

- POM 3430 - Operations Management (3)
- POM 3990 - ACHIEVE III - Operations Management (0)

Required for Lean and Quality Specialization

- POM 4400 - Process Management (3)
- POM 4410 - Operations Analytics (3)
- POM 4430 - Operations Planning and Control (3)
- POM 4600 - Lean Kaizen in Organizations (3)

Electives

Choose one (1) from the list of Electives

- POM 4350 - Management of Service Operations (3)
- POM 4420 - Supply Chain Management (3)
- POM 4480 - Project Management (3)
- POM 4470 - Procurement and Global Sourcing (3)
- QMM 4400 - Management Science (3)
- QMM 4520 - Forecasting (3)

Students on a previous catalog can use POM 4410 and POM 4600 as a required course and POM 4470 as an elective course for Lean and Quality Management Specialization.

Business Administration, Operations Management Major, B.S., Specialization in Project Management

Minimum of 22 Credits

The focus of this specialization centers on the ten knowledge management areas comprising the project management body of knowledge. These ten knowledge management areas include project integration, scope, human resource, time, cost, quality, risk, procurement, communications, and stakeholder management. The set of courses comprising this specialization emphasize the skills and techniques necessary to successfully lead and manage projects.

Note

Below are specific major requirements that must be completed in addition to the Requirements for Business Administration Majors (follow link to view additional requirements).

Required for OM Major

- POM 3430 - Operations Management (3)
- POM 3990 - ACHIEVE III - Operations Management (0)

Required for Project Management Specialization

- ACC 4180 - Accounting Information Systems: Planning and Analysis (3)
- ORG 4310 - Leadership and Group Performance (4)
- POM 4410 - Operations Analytics (3)
- POM 4470 - Procurement and Global Sourcing (3)
- POM 4480 - Project Management (3)

Electives

Choose one (1) from the list of Electives

- POM 4350 - Management of Service Operations (3)
- POM 4400 - Process Management (3)

- POM 4420 - Supply Chain Management (3)
- POM 4430 - Operations Planning and Control (3)
- POM 4600 - Lean Kaizen in Organizations (3)
- QMM 4400 - Management Science (3)
- QMM 4520 - Forecasting (3)

Students on a previous catalog can use POM 4410 and POM 4470 as a required course and POM 4600 as an elective course for Project Management Specialization.

Business Administration, Operations Management Major, B.S., Specialization in Supply Chain Management

Minimum of 22 Credits

Most organizations realize that they cannot achieve long-term success if they were to focus on their internal processes only. Thus, an essential feature of SCM is the management of relationships among organizations; which typically have different cultures, goals and strategies. The SCM specialization trains students to manage processes and complex relationships among organizations. Areas covered include planning and design for supply chains (SC), production processes, SC risks, procurement in the traditional and global contexts, distribution in SC and deployment of information technology to facilitate SC operations.

Note

Below are specific major requirements that must be completed in addition to the Requirements for Business Administration Majors (follow link to view additional requirements).

Required for OM Major

- POM 3430 - Operations Management (3)
- POM 3990 - ACHIEVE III - Operations Management (0)

Required for Supply Chain Specialization

- POM 4410 - Operations Analytics (3)

- POM 4420 - Supply Chain Management (3)
- POM 4430 - Operations Planning and Control (3)
- POM 4470 - Procurement and Global Sourcing (3)
- MKT 4220 - Marketing Logistics and Supply Chain Management (3)

Electives

Choose one (1) from the list of Electives

- POM 4350 - Management of Service Operations (3)
- POM 4400 - Process Management (3)
- POM 4480 - Project Management (3)
- POM 4600 - Lean Kaizen in Organizations (3)
- QMM 4900 - Special Topics in Quantitative Methods (3)
- QMM 4520 - Forecasting (3)

Students who are on a previous catalog can count POM 4410, POM 4470 and MKT 4220 as a required course and POM 4600 as an elective course for the Supply Chain Specialization.

Business Analytics Minor

The minor in business analytics (BA) consists of 12 credits for SBA students. Non-SBA students should contact the minor coordinator to determine the credit requirements.

The BA minor consists of the following courses and their prerequisites:

- MIS 4460 - Business Analytics (3)
- MIS 4560 - Introduction to Data Science (3)

or

- MIS 4470 - Practical Computing for Data Analytics (3)
- MTH 1222 - Calculus for the Social Sciences (4) or MTH 1554 - Calculus I (4)

- QMM 2410 - Statistical Methods for Business II (3) or EGR 2600 - Introduction to Industrial and Systems Engineering (4) or STA 2221 - Introduction to Statistical Methods (4) or STA 2226 - Applied Probability and Statistics (4)

Students are recommended to take both MIS 4560 and MIS 4470. If students take both of these courses, one of them will be counted towards the elective. Students who have taken MIS4470 or MIS5470 and are under a previous catalog can count these as required courses for the BA Minor.

And any two of the following courses:

- ACS 4660 - Financial Economics (3)
- APM 4334 - Applied Numerical Methods: Matrix Methods (4)
- ECN 4050 - Econometrics (3)
- ECN 4060 - Time Series Econometrics (3)
- FIN 4250 - Financial Derivatives (3)
- MIS 4410 - Operations Analytics (3) or POM 4410 - Operations Analytics (3)
- MIS 4500 - Web Analytics (3)
- MIS 4560 - Introduction to Data Science (3)

or

- MIS 4470 - Practical Computing for Data Analytics (3)
- MIS 4900 - Special Topics in MIS (3) (with Minor Coordinator's approval)
- MTH 2775 - Linear Algebra (4)
- QMM 4400 - Management Science (3)
- QMM 4520 - Forecasting (3)
- STA 4002 - Applied Linear Models I (4)
- STA 4330 - Time Series I (4)

Notes

* Students are recommended to take both MIS 4560 and MIS 4470. If students take both of these courses, one of them will be counted towards a required course and one toward an elective course.

A minimum grade of C must be earned in each course in the business analytics minor and in the prerequisites for each course.

Certain MIS 4900 or POM 4900 Special Topics courses can count as a minor requirement with prior approval of the minor coordinator based on the topic.

This minor is open to all majors. Non-SBA students should contact the minor coordinator to determine the total number of courses required for the minor.

The minor in business analytics (BA) adds only four courses to the degree requirements for SBA students.

Students cannot obtain both a minor in Business Analytics and a MIS major with a Business Analytics specialization.

Information Security Management Minor

The minor in information security management (ISM) consists of a minimum of four courses for SBA students. Non-SBA students should contact the minor coordinator to determine the credit requirements. The ISM minor consists of the following courses and any prerequisites for these courses: (MIS 1000 or CSI 1200), (MIS 3000 or MIS 3010), MIS 3050, MIS 4170, MIS 4180 and one elective from MIS 4130, MIS 4140, MIS 4700, or MIS 4750. A minimum grade of C must be earned in each course in the ISM minor and in the prerequisites for each course. This minor is open to all students except MIS majors.

Certain MIS 4900 Special Topics courses can count as a minor requirement with prior approval of the minor coordinator based on the topic. Students cannot obtain both the ISM Minor and Major with ISM Specialization.

Students who have taken MIS 4170 under a previous catalog will be able to count this as a required course for the ISM minor and can use MIS4170 as a substitute for MIS4800.

Management Information Systems Minor

The minor in management information systems (MIS) consists of a minimum of four courses for SBA students. Non-SBA students should contact the minor coordinator to determine the credit requirements. The MIS minor consists of the following courses and any prerequisites for these courses: (MIS 1000 or CSI 1200), (MIS 3000 or MIS 3010), MIS 3050, MIS 3140, MIS 4050, and one 4000 level

elective in MIS. A minimum grade of C must be earned in each course in the MIS minor and in the prerequisites for each course. This minor is open to all students except MIS majors.

Students who have taken MIS 4140, MIS 4170, MIS 4180, MIS 4460, MIS 4470, MIS 4500, MIS 4560, MIS 4700, MIS 4750, MIS 5460, MIS 5630 or MIS 5640 under a previous catalog will be able to count these courses as electives.

Operations Management Minor

The minor in operations management (OM) consists of a minimum of four courses for SBA students. Non-SBA students should contact the minor coordinator to determine the credit requirements. The OM minor consists of the following courses and their prerequisites: MTH 1222 or MTH1554, QMM 2400 or STA 2220 or STA 2226, QMM 2410, ACC 2000, ACC 2100, POM 3430 and three courses chosen from POM 4350, POM 4400, POM 4410/MIS 4410, POM 4420, POM 4430, POM 4470, POM 4480 or POM 4600. A minimum grade of C must be earned in each course in the operations management minor and in the prerequisites for each course. This minor is open to all students except operations management majors.

Students who have taken POM 4410/MIS 4410, POM 4350, POM 4470, and POM 4600 under a previous catalog will be able to count these courses as an elective.

Business Administration, General Management Major, B.S.

Requirements for the major in general management, B.S.

The general management major allows students to take advanced work in several functional areas of business. Students may not earn a double major in general management and another major of the School of Business Administration.

To fulfill requirements for the general management major, students must be admitted to major standing in general management, complete the core program, ORG 4310, and earn a minimum of 11 additional credits in electives with a grade of C or better in each major course. The electives may be chosen from any area within the SBA (courses beginning with ACC, ECN, ENT, FIN, MGT, MIS, MKT, ORG, POM or QMM) and must be chosen from courses numbered 3000 or higher. At least six credits must be at the 4000 level which includes ORG 4310. A grade of C or better must be achieved in each prerequisite for a general management elective course before a general management major may begin work in that

general management elective course. No more than four credits of independent study (MGT 4996) may be used to meet the major elective requirement.

Note

Below are specific major requirements that must be completed in addition to the Requirements for Business Administration Majors (follow link to view additional requirements).

Required major courses

- MGT 3990 - ACHIEVE III - General Management (0)
- ORG 4310 - Leadership and Group Performance (4)

Electives

Choose 11 additional elective credits from any area within the SBA (courses beginning with ACC, ECN, ENT, FIN, MGT, MIS, MKT, ORG, POM or QMM).

Business Administration, Human Resources Management Major, B.S.

Requirements for the major in human resources management, B.S.

The major in human resources management develops the skills needed to administer the personnel functions of organizations. It is designed primarily for students who intend to pursue careers in administration, human resources management, labor relations, or wherever the management of people at work is a central concern.

Emphasis is placed on developing an intensive understanding of the concepts and techniques needed to acquire, develop and utilize an organization's human resources. The program includes broad coverage of such topics as personnel psychology, human resources administration and labor/management relations, in addition to providing basic knowledge of organizational behavior.

To fulfill requirements for the human resources management major, students must be admitted to major standing in human resources management, complete the core program and earn at least 25 credits as specified below, with a grade of C or better in each major course. A grade of C or better must be achieved in each prerequisite for a human resources management course before a HRM major, or any Oakland University student, may begin work in that human resources management course.

Students who have taken ORG 4600 under a previous catalog will be able to count this course as an elective.

Note

Below are specific major requirements that must be completed in addition to the Requirements for Business Administration Majors (follow link to view additional requirements).

Required in the core -- 6 credits

- ORG 3300 - Introduction to Organizational Behavior (3)
- ORG 3310 - Introduction to the Management of Human Resources (3)

Required major courses -- 12 credits

- ORG 3990 - ACHIEVE III - Human Resource Management (HRME) (0)
- ORG 4300 - Organizational Research Methods (4)
- ORG 4340 - Advanced Human Resources Management (4)
- ORG 4600 - Compensation and Benefits (4)

Electives - choose two courses, at least one of which must be a 4000-level ORG course -- 7-8 credits

- ORG 4310 - Leadership and Group Performance (4)
- ORG 4320 - Motivation and Work Behavior (4)
- ORG 4330 - Labor/Management Relations (4)
- ORG 4700 - International Organizational Behavior and Human Resources Management (4)
- ORG 4900 - Topics in Organizational Management (1 TO 4)
- MGT 4900 - Seminar: Current Business Topics (1 TO 4)
- ECN 3380 - Economics of Human Resources (3)
- PS 3325 - Public Sector Human Resource Management (4)

25-26 total credits

Additional Information:

In addition to the course requirements listed above, students interested in pursuing human resources management (HRM) major must also complete the Human Resources Management Experience (HRME) requirement which will satisfy ORG 3990. The options for this requirement are described below:

1. Internship

1. HRME contract -

- Student must receive HRM faculty adviser approval prior to beginning the work experience.

- For students who would like to substitute their current or recent work experience, the student must complete the contract for the appropriate job and schedule a meeting with the HRM major adviser for approval. Additional support may be required when using previous experience to fulfill this requirement.

- The student's work experience must meet the minimum contact hours requirement (280 hours).

2. Exit interview -

- Upon completion of the internship or equivalent experience, the student must submit written answers to the specified exit interview questions to the major adviser.

- Students must also have their internship supervisor submit a letter on company letterhead to the HRM major adviser stating the following: hours worked, time period (e.g. months/year), and basic job duties.

- Upon documentation of the exit interview, written documentation of the completion of the requirement will be provided to the student and the Undergraduate Advising Office within two weeks.

2. Portfolio Project

Information concerning this option is available from the HRM Major Adviser. These items represent new work that represents an HRM skill set. Once the student submits all required aspects of the project to the HRM Major Adviser, written documentation of the completion of the requirement will be provided to the student and the Undergraduate Advising Office within two weeks.

The above options also satisfy the requirement for ORG 3990. This includes all students who have taken ORG 3990 since fall 2010.

A grade of S must be obtained for ORG 3990.

Business Administration, Marketing Major, B.S.

Requirements for the major in marketing, B.S.

The major in marketing develops the specific skills, modes of analysis and background to work in the marketing area of a profit-making business or not-for-profit enterprise. It is designed primarily for students who intend to pursue careers in fields such as marketing, sales, research, product development and management, advertising, communication, retail buying and distribution management.

Emphasis is placed on developing a comprehensive understanding of the concepts and techniques needed to plan, develop and execute the tactical activities associated with creating a strategic position

in the marketplace. These include activities such as the development of products and services, pricing strategies, promotional activities, and distribution and channel management, in order to facilitate exchanges that create value for both consumers and organizations. The program includes broad coverage of such topics as marketing management, consumer behavior, marketing research, selling and sales management, advertising and communications, digital marketing, business-to-business marketing, social marketing, business logistics, retailing, and international marketing.

To fulfill the requirements for the major in marketing, students must be admitted to major standing in marketing, complete the core program and complete a minimum of 24 credits, as specified below, with a grade of C or better in each major course. A grade of C or better must be achieved in each prerequisite for a marketing course before a marketing major, or any Oakland University student, may begin work in that marketing course.

Students on a previous catalog who have taken MKT 4100, MKT 4210, MKT 4220, or MKT 4600 will be able to count these courses toward an elective requirement.

Note

Below are specific major requirements that must be completed in addition to the Requirements for Business Administration Majors (follow link to view additional requirements).

Required in the core -- 3 credits

- MKT 3020 - Marketing (3)

Required major courses -- 12 credits

- MKT 3990 - ACHIEVE III - Marketing (0)
- MKT 4040 - Consumer Behavior (4)
- MKT 4050 - Marketing Research (4)
- MKT 4530 - Strategic Marketing Management (4)

Electives -- choose three courses --9 credits

- MKT 4060 - Integrated Marketing Communications (3)
- MKT 4100 - Digital Marketing (3)
- MKT 4210 - Distribution Channels Management and Retailing (3)
- MKT 4220 - Marketing Logistics and Supply Chain Management (3)
- MKT 4300 - Personal Selling (3)
- MKT 4500 - International Marketing (3)
- MKT 4550 - Product Management (3)

- MKT 4600 - Entrepreneurial Marketing (3)
- MKT 4700 - Business to Business Marketing (3)
- MKT 4900 - Seminar in Marketing (1 TO 4)

24 total credits

Business Minor

The minor in business consists of a minimum of six courses described below, and any prerequisites for these courses. A minimum grade of C must be earned in each course in the business minor and in the pre-requisites for each course. This minor is not open to pre-business students, business undecided students or students holding major standing in the School of Business Administration. ACC 3000, MGT 3000, MIS 3010, MGT 3000, POM 3000, and FIN 3000 cannot be used to fulfill the requirement of any other SBA major or other SBA minor, except for the Entrepreneurship minor or the International Management minor for non-SBA students. In addition, these courses cannot be used to fulfill any of the pre-core course requirements for the Master of Business Administration, Master of Accounting, or Master of Science in Information Technology Management degrees at Oakland University.

Required courses

- ACC 2000 - Financial Accounting (4) or ACC 3000 - Survey of Accounting (4)
- ECN 1500 - Economics in Today's World (4) or ECN 1600 - Introduction to the Global Economy (4)

or

- ECN 2000 - Principles of Macroeconomics (4) or ECN 2010 - Principles of Microeconomics (4)
- ECN 2020 - Principles of Global Macroeconomics (4)

Electives-take four (4) of the following courses/categories

- ENT 3010 - Developing New Venture Ideas (3)
- FIN 3000 - Survey of Finance (3)
- MGT 3000 - Survey of Management (3) or ORG 3300 - Introduction to Organizational Behavior (3)
- MGT 3500 - Legal Environment of Business (3)
- MIS 3010 - Survey of Management Information Systems (3) or MIS 3000 - Management Information Systems (3)

- MKT 3000 - Survey of Marketing (3)
- POM 3000 - Survey of Operations Management (3)

Entrepreneurship Minor

The Entrepreneurship minor teaches students how to start their own business and successfully launch new ideas. Courses in the Entrepreneurship minor are designed so students can complete the minor rapidly while still maximizing their knowledge and skills.

For business majors

The minor consists of a minimum of four courses.

This includes two required courses ENT 3010, ENT 4400, and two elective courses from ENT 3050, MKT 4550, MKT 4600, MGT 4540, ORG 4310 or ENT 4900.

For non-business majors

The minor consists of a minimum of five courses.

This includes two courses from the following: MKT 3000, MGT 3000, ACC 3000 (or ACC 2000), or FIN 3000 to help prepare the non-business major for the rest of the program.

Then they should take two required courses ENT 3010, ENT 4400, and one elective course from ENT 3050, MKT 4550, MKT 4600, MGT 4540, ORG 4310 or ENT 4900.

A minimum grade of C must be earned in each required course, as well as in the prerequisites for each course. This minor is open to all students.

Human Resources Management Minor

The minor in human resources management consists of a minimum of five courses described as follows: ORG 3300, ORG 3310 and ORG 4340 and two courses chosen from ORG 4300, ORG 4310, ORG 4320, ORG 4330, ORG 4600, ORG 4700, ORG 4900 and the prerequisites for these courses. A minimum grade of C must be earned in each course in the human resources management minor and in the prerequisites for each course. This minor is open to all students except SBA human resources management majors.

International Management Minor

Students who graduate with an international management minor will have an understanding of the complexities of doing business in a globally integrated marketplace and the impact of political, economic, cultural factors that underlie global decision making. Additionally, students will be able to identify international opportunities, and the factors that impact success of global business endeavors. The minor requires a minimum of four courses for business students, and five courses for students from all other majors. Students will discover strategies organizations employ when they operate worldwide and learn about the organizational behavior of companies from different parts of the world.

This minor is particularly relevant for students who are interested in working in globally integrated industries like automotive, defense, and technology, and is complimentary for a diverse range of majors, including engineering and computer science, international relations, and most liberal arts majors.

International Management Minor - All business majors

The International Management Minor has several different tracks that allow business students to pursue their major, while complimenting their knowledge base with a global focus that will broaden their opportunities in any industry.

Courses

- ECN 3730 (3)
- MGT 4230 (4)
- MGT 4250 (4)
- One course required; choose from; ECN 3260 (3), ECN 3740 (3), MKT 4500 (3), ORG 4700 (4), or FIN 4190 (3)

International Management Minor - All non-business majors

The International Management minor offers the opportunity for students from all majors to learn the basic concepts of business, in addition to the foundations of doing business in the global marketplace.

Courses

- ECN 2020 (4)
- MGT 3000 (3)
- One course from: ACC 2000 (4) or ACC 3000 (4), FIN 3000 (3), MIS 3000 (3), MKT 3000 (4)
- MGT 4230 (4)
- MGT 4250 (4)

A minimum grade of C must be earned in each course in the International Management Minor and in the prerequisites for each course.

Marketing Minor

The minor in marketing consists of a minimum of five courses, including four foundation courses and one elective.

- MKT 3020
- MKT 4040
- MKT 4050
- MKT 4530

One elective course is chosen from the following:

- MKT 4060
- MKT 4100
- MKT 4210
- MKT 4220
- MKT 4300
- MKT 4500
- MKT 4550
- MKT 4600
- MKT 4700
- MKT 4900
- in addition to the prerequisites for these courses

A minimum grade of C must be earned in each course in the marketing minor and in the prerequisites for each course

This minor is open to all students except marketing majors.

Students on a previous catalog who have taken MKT 4100, MKT 4210, MKT 4220, MKT 4550, or MKT 4600 will be able to count these courses toward an elective requirement.

Actuarial Science, B.S., Mathematics

Requirements for the major in actuarial science, B.S. program

Because an actuary needs a blend of mathematics, economics, statistics and finance, this major is offered jointly by the Department of Mathematics and Statistics and the Department of Economics. However, the major in actuarial science differs significantly from the other majors offered by these two departments because it (1) prepares students for jobs in actuarial science and provides them with the educational background necessary to pursue an advanced degree in economics, mathematics, statistics, or business administration, (2) integrates two distinctly different disciplines, thereby providing students with a breadth of knowledge that is needed in a fast-changing world, and (3) provides students with the analytical and reasoning skills to successfully complete the first two exams in actuarial science offered by the Society of Actuaries.

To earn the Bachelor of Science degree with a major in actuarial science, students must

1. Complete Basic Mathematics Requirements

- MTH 1554 - Calculus I (4)
- MTH 1555 - Calculus II (4)
- MTH 2554 - Multivariable Calculus (4)
- MTH 2775 - Linear Algebra (4)

2. Complete Probability Requirements

- ACS 3000 - Foundations of Probability and Calculus (1) (unless the student has earned a grade of at least B+ in MTH 2554 - Multivariable Calculus (4) or permission of the chief undergraduate adviser)
- STA 2226 - Applied Probability and Statistics (4)
- STA 4227 - Introduction to Mathematical Statistics I (4)

3. Complete Economics Requirements

- ECN 2010 - Principles of Microeconomics (4) and ECN 2020 - Principles of Global Macroeconomics (4) (or ECN 2000 - Principles of Macroeconomics (4))
- ECN 3020 - Intermediate Macroeconomics (3) or ECN 3210 - Financial Markets and Economy (3)

(Students under a previous catalog who have taken ECN 3210 may use this course as a substitute for ECN 3020)

- ECN 3030 - Managerial Economics (3) or ECN 3810 - Mathematical Analysis for Economists (3)

(Students under a previous catalog who have taken ECN 3810 may use this course as a substitute for ECN 3030)

4. Complete Statistics Requirement

- QMM 2410 - Statistical Methods for Business II (3) or STA 4330 - Time Series I (4) or STA 4228 - Introduction to Mathematical Statistics II (4)

(Students under a previous catalog who have taken ECN 4060 or STA 4228 or STA 4330 may use these courses as a substitute for QMM 2410.)

5. Complete Accounting and Finance Requirements

- ACC 2000 - Financial Accounting (4)

- FIN 3550 - Finance for Actuarial Science (4) or (FIN 3220 Managerial Finance I (3) and FIN 3720 Managerial Finance II (3)) (Students under a previous catalog who have taken FIN 3550 may use this course a substitute for FIN 3220)

6. Complete Regression Requirement

- ECN 4050 - Econometrics (3) or STA 4002 Applied Linear Models I (4)

7. Complete Database and Programming Requirements

- EGR 1400 - Computer Problem Solving in Engineering and Computer Science (4)

- MIS 3130 - Information and Data Management (3) or MIS 3140 - Business Database Systems (3)

(Students under a previous catalog who have taken MIS 3130 may use this course as a substitute for MIS 3140.)

- MIS 4460 - Business Analytics (3)

8. Complete Additional Mathematics-Statistics Requirement

- APM 2559 - Introduction to Differential Equations (4) or STA 4225 - Elements of Stochastic Processes (4) or APM 4334 - Applied Numerical Methods: Matrix Methods (4) (Students under a previous catalog who have taken APM 2559 may use this course as an elective choice)

9. Complete Financial Mathematics Requirement

- ACS 4550 - Financial Mathematics (3)

10. Complete Financial Derivatives Requirement

- ACS 4660 - Financial Economics (3) or FIN 4250 - Financial Derivatives (3)

11. Complete cognate courses

- WRT 3082 - Business Writing (4)

- COM 2000 - Public Speaking (4) or COM 2403 - Group Dynamics and Communication (4)

12. Complete ACHIEVE courses

- SBC 1990 - ACHIEVE I (0) (to be taken during the freshman year or first year as an actuarial science major)
- SBC 2990 - ACHIEVE II (0) (to be taken during the fall semester of the sophomore year or the second semester as an actuarial science major)
- ACS 3990 - ACHIEVE 3 Actuarial Sciences (0) (to be taken during the second semester of the sophomore year or the third semester as an actuarial science major)

13. Earn a minimum grade of C in all courses applied to the major including cognate courses for the major.

Additional Information

In addition to these major requirements, students must complete the Oakland University General Education Requirements, the College of Arts and Sciences College Exploratory Requirement, and an appropriate number of free elective classes to meet the overall credit requirement for the degree (in most cases 124; some degrees may require a greater number).

As a general rule, no more than eight credits of course work used to satisfy one major, minor or concentration may be applied toward another, but exceptions to this rule may be allowed with the written approval of the program coordinators.

Business Administration, Business Actuarial Science, B.S.

This major serves as an alternative to the Actuarial Science (ACS) Major. Students selecting the Business Actuarial Sciences (BACS) major will complete all of the Actuarial Sciences major-specific requirements. Some of these requirements overlap with the requirements of the business major. Students must complete all additional requirements for the business degree. Upon graduation, students will receive the BS in Business Administration with a major in Business Actuarial Sciences (BACS) degree. Whenever there are changes to the ACS major, they will also be made to the BACS major.

Requirements for the Bachelor of Science degree with a major in business actuarial science, students must complete the following actuarial and business requirements.

1. Complete Basic Mathematics Requirements (16 credits)

- MTH 1554 - Calculus I (4)
- MTH 1555 - Calculus II (4)
- MTH 2554 - Multivariable Calculus (4)
- MTH 2775 - Linear Algebra (4)

2. Complete Probability Requirements (8 to 9 credits)

- ACS 3000 - Foundations of Probability and Calculus (1) (unless the student has earned a grade of at least B+ in MTH 2554 - Multivariable Calculus (4) or permission of the chief undergraduate actuarial adviser)
- STA 2226 - Applied Probability and Statistics (4)
- STA 4227 - Introduction to Mathematical Statistics I (4)

3. Complete Economics Requirements (17 credits)

- ECN 2010 - Principles of Microeconomics (4) and
- ECN 2020 - Principles of Global Macroeconomics (4) (or ECN 2000 Principles of Macroeconomics (4))
- ECN 3020 - Intermediate Macroeconomics (3) or ECN 3210 - Financial Markets and Economy (3)
- ECN 3030 - Managerial Economics (3) or ECN 3810 - Mathematical Analysis for Economists (3)
- ECN 3500 - Insurance and Risk Management (3)

4. Complete Statistics Requirements (3 to 4 credits)

- QMM 2410 - Statistical Methods for Business II (3) or
- STA 4228 - Introduction to Mathematical Statistics II (4) or
- STA 4330 - Time Series I (4)

5. Complete Accounting and Finance Requirements (8 to10 credits)

- ACC 2000 - Financial Accounting (4)
- FIN 3550 - Finance for Actuarial Science (4) or (FIN 3220 Managerial Finance I (3) and FIN 3720 Managerial Finance II (3))

6. Complete Regression Requirements (3 to 4 credits)

- ECN 4050 - Econometrics (3) or STA 4002 Applied Linear Models I (4)

7. Complete Database and Programming Requirements (10 credits)

- EGR 1400 - Computer Problem Solving in Engineering and Computer Science (4)
- MIS 3130 - Information and Data Management (3) or MIS 3140 Business Database Systems (3)
- MIS 4460 - Business Analytics (3)

8. Complete Additional Mathematics-Statistics Requirements (4 credits)

- APM 2559 - Introduction to Differential Equations (4) or
- APM 4334 - Applied Numerical Methods: Matrix Methods (4) or
- STA 4225 - Elements of Stochastic Processes (4)

9. Complete Financial Mathematics Requirement (3 credits)

- ACS 4550 - Financial Mathematics (3)

10. Complete Financial Derivatives Requirement (3 credits)

- ACS 4660 - Financial Economics (3) or FIN 4250 Financial Derivatives (3)

11. Complete cognate course (8 credits)

- COM 2000 - Public Speaking (4) or COM 2403 Group Dynamics and Communication (4)
- WRT 3082 - Business Writing (4)

12. Complete ACHIEVE courses (0 credits)

- SBC 1990 - ACHIEVE I (0) (to be taken during the freshman year or first year as an actuarial science major)
- SBC 2990 - ACHIEVE II (0) (to be taken during the fall semester of the sophomore year or the second semester as an actuarial science major)
- ACS 3990 - ACHIEVE 3 Actuarial Sciences (0) (to be taken during the second semester of the sophomore year or the third semester as an actuarial science major)

13. Complete additional SBA Pre-Core Requirements (7 credits)

- ACC 2100 - Managerial and Cost Accounting I (4)
- MIS 1000 - Business Problem Solving with Information Technology (3)

14. Complete additional SBA Core Requirements (21 credits)

- MGT 3500 - Legal Environment of Business (3)
- MGT 4350 - Management Strategies and Policies (3)
- MIS 3000 - Management Information Systems (3)
- MKT 3020 - Marketing (3)
- ORG 3310 - Introduction to the Management of Human Resources (3)
- ORG 3300 - Introduction to Organizational Behavior (3)
- POM 3430 - Operations Management (3)

124 Minimum Total Credits Required to Graduate

Business Administration, Business Economics Major, B.S.

Requirements for the major in Business Economics, B.S.

The Bachelor of Science in Business Administration with a major in business economics combines studies of the basic functional areas of business with the analytical and quantitative methods of economics and therefore provides students with the ability to apply general concepts of economics to help solve managerial problems. This major prepares students for careers in business management or public administration, or for graduate study in business, economics or law.

To fulfill the requirements for the business economics major, students must be admitted to major standing in business economics, complete the core program and complete a minimum of 30 credits, as specified below, with a grade of C or better in each major course. A grade of C or better must be achieved in each prerequisite for an economics course before a business economics major, or any Oakland University student, may begin work in that economics course.

Note

Below are specific major requirements that must be completed in addition to the Requirements for Business Administration Majors (follow link to view additional requirements).

Required in the pre-core and core (11 credits)

- ECN 2010 - Principles of Microeconomics (4)
- ECN 2020 - Principles of Global Macroeconomics (4) or ECN 2000 - Principles of Macroeconomics (4)
- ECN 3030 - Managerial Economics (3)

Required major courses (12 credits)

- ECN 3020 - Intermediate Macroeconomics (3)
- ECN 3040 - Consumer and Welfare Economics (3)
- ECN 3990 - ACHIEVE III - Business Economics (0)
- ECN 4050 - Econometrics (3)
- ECN 4180 - Seminar in Economic Policy (3)

Complete ACHIEVE courses (0 credits)

- SBC 1990 - ACHIEVE I (0) (to be taken during the freshman year or first year as a business economics major)
- SBC 2990 - ACHIEVE II (0) (to be taken during the fall semester of the sophomore year or the second semester as a business economics major)
- ECN 3990 - ACHIEVE III - Business Economics (0) (to be taken during the second semester of the sophomore year or the third semester)

Electives - choose three courses (9 credits)

- ECN 3060 - Applied Time Series Analysis in Business (3)
- ECN 3070 - Using "BIG" Data for Economic Problems (3)
- ECN 3090 - State and Local Public Finance (3)
- ECN 3100 - Economics of the Environment (3)
- ECN 3150 - Economics of Gender and Ethnicity (3)
- ECN 3210 - Financial Markets and Economy (3)
- ECN 3260 - International Economic Development (3)
- ECN 3330 - History of Economic Thought (3)
- ECN 3380 - Economics of Human Resources (3)
- ECN 3500 - Insurance and Risk Management (3)
- ECN 3670 - Economics of Health Care (3)
- ECN 3730 - International Trade (3)
- ECN 3740 - Economics of Intl Finance (3)
- ECN 3780 - Economic Analysis of Law (3)
- ECN 3800 - Topics in Economics (3)
- ECN 3810 - Mathematical Analysis for Economists (3)
- ECN 3850 - Economics of Industries (3)
- ECN 4060 - Time Series Econometrics (3)
- ECN 4090 - Urban and Regional Economics (3)
- ECN 4210 - Monetary Economics (3)

- ECN 4560 - Public Finance (3)
- ECN 4900 - Special Topics in Economics (3)

32 credits total

Students who have taken STA 2220 or STA 2226 under a previous catalog may use these courses to satisfy the QMM 2400 requirement.

Although ECN 3020, ECN 3030 and ECN 3040 are not required for admission to major standing in economics, students must earn a grade of C or better in ECN 3020, ECN 3030 and ECN 3040 in order to graduate.

Students on a previous catalog may use ECN 3060, ECN 3070, ECN 3500, and ECN 3810 as an Economics elective.

Economics, B.A.

Requirements for the liberal arts major in economics, B.A. program

The program leading to a Bachelor of Arts degree in economics includes cognate courses in mathematics, statistics and computers and required economics courses and economics electives, as listed below. Students who have taken ECN 1500 or ECN 1600 before ECN 2010 or ECN 2020 (or ECN 2000) and who subsequently become economics majors, should talk to the department chairperson. The economics major must complete each of the cognate, required and elective courses with a grade of C or better:

Cognate courses

- MIS 1000 - Business Problem Solving with Information Technology (3)
- MTH 0661 - Elementary Algebra (4) (if required by ACT or SAT scores)
- MTH 0662 - Intermediate Algebra (4) (if required by ACT or SAT scores)
- MTH 1221 - Linear Programming Elementary Functions (4) or MTH 1441 - Precalculus (4)
- MTH 1222 - Calculus for the Social Sciences (4) or MTH 1554 - Calculus I (4)
- QMM 2400 - Statistical Methods for Business I (3) (or STA 2220 or STA 2226) and QMM 2410 - Statistical Methods for Business II (Students who have taken STA 2220 or STA 2226 under a previous catalog may use these courses to satisfy the QMM 2400 requirement)

Required courses

- ECN 2010 - Principles of Microeconomics (4) and ECN 2020 - Principles of Global Macroeconomics (4) or ECN 2000 - Principles of Macroeconomics (4)

- ECN 3020 - Intermediate Macroeconomics (3)
- ECN 3030 - Managerial Economics (3)
- ECN 3040 - Consumer and Welfare Economics (3)
- ECN 4180 - Seminar in Economic Policy (3)

Economics major electives

Choose five economics electives at the 3000 level or above. No more than 3 credits of ECN 4996, ECN 3800, or ECN 4900 may be counted as electives. Students taking ECN 1500 or ECN 1600 before ECN 2000, ECN 2010 or ECN 2020, and who subsequently become economics majors, should talk to the department chairperson.

Note: Students must meet any course prerequisites before taking these courses. All cognate, required and major elective courses must be completed with a grade of C or better.

Additional Information

In addition to these major requirements, students must complete the Oakland University General Education Requirements, the College of Arts and Sciences College Exploratory Requirement, and an appropriate number of free elective classes to meet the overall credit requirement for the degree (in most cases 124; some degrees may require a greater number).

As a general rule, no more than eight credits of course work used to satisfy one major, minor or concentration may be applied toward another, but exceptions to this rule may be allowed with the written approval of the program coordinators.

Economics Major, B.S.

Requirements for the major in economics, B.S

The Bachelor of Science with a Major in Economics is offered through the School of Business Administration, but is different from Bachelor of Science in Business Administration with a Major in Business Economics. The latter is a business degree, and the former is not. By not requiring the business core, the Major in Economics provides students greater flexibility. This major teaches students the concepts and tools of economic analysis, while providing them with the breadth and flexibility of a broad general education and courses in other areas of interest to the student. Students learn how economic analysis can be applied to major problems facing individuals, firms, the nation and the world today. Majoring in economics prepares students for the workplace of the future, which will require workers who are flexible, adaptable to change, and who can propose practical solutions to solve problems quickly.

Besides preparing students for a career in the private or public sector, an education in economics is excellent preparation for law school, graduate school in public administration or economics, or an MBA degree. Economics is a flexible choice for students seeking a rigorous, well-respected and relevant major without specializing in a narrowly defined area.

Beyond the Bachelor of Science with a major in business economics (a business degree, described previously), the Department of Economics offers four economics programs: a Bachelor of Arts in Economics (offered through the College of Arts and Sciences), a Bachelor of Science in Economics (offered through the School of Business Administration), a Bachelor of Science with a Major in Actuarial Science (offered through the College of Arts and Sciences), and a minor in economics. The Bachelor of Arts degree allows a student to pursue a liberal arts education while providing a background that business considers appropriate for most entry-level management positions (see the Department of Economics section in the College of Arts and Sciences portion of the catalog). The Bachelor of Science degree has additional accounting and finance requirements. It also provides educational and career flexibility not offered by a degree in business. The Bachelor of Science with a Major in Actuarial Science blends mathematics, economics, statistics, and finance, and is offered jointly with the Department of Mathematics and Statistics. The minor in economics is useful for liberal arts majors with an interest in business and for business majors who want to demonstrate their solid grounding in economics, the foundation of a business degree.

Students who are interested in attending graduate school in economics should see the department chairperson or an economics faculty mentor at an early stage of their undergraduate program. Professional advisers in the SBA (for B.A. and B.S. degrees) and the College of Arts and Sciences (for B.A. degree) or the chairperson of the Department of Economics offer routine student advising.

To earn the Bachelor of Science degree with a major in economics, students must complete a minimum of 124 credits as follows:

English composition (4 to 8 credits)

- WRT 1060 - Composition II (4) (or complete the writing requirement in another manner as detailed in the general education section of Undergraduate degree requirements)
- WRT 3082 - Business Writing (4) or ENG 3110 - Advanced Critical Writing

General education requirement (28 credits)

See the university General Education Requirements section of the Undergraduate degree requirements for details on the writing requirement, U.S. diversity and other general education requirements. Students on a previous catalog may use economics courses to satisfy the social science general education requirement.

Cognate courses (28 or 29 credits)

- ACC 2000 - Financial Accounting (4)
- ACC 2100 - Managerial and Cost Accounting I (4)

- CSI 1200 - Introduction to Computing and Programming using Excel (4) or MIS 1000 - Business Problem Solving with Information Technology
- FIN 3220 - Managerial Finance I (3)
- MTH 1221 - Linear Programming Elementary Functions (4) or MTH 1441 - Precalculus
- MTH 1222 - Calculus for the Social Sciences (4) or MTH 1554 - Calculus I

* If a student places into and completes MTH 1222 or MTH 1554 with the required minimum grade, MTH 1221 or MTH 1441 is not required.

* If a student receives transfer credit for MTH 1222 or MTH 1554, MTH 1221 or MTH 1441 is not required.

- QMM 2400 - Statistical Methods for Business I (3) or (STA 2220 or STA 2226) and QMM 2410 - Statistical Methods for Business II

Required courses (23 credits)

- ECN 2010 - Principles of Microeconomics (4)

and

- ECN 2000 - Principles of Macroeconomics (4)

or

- ECN 2020 - Principles of Global Macroeconomics (4)
- ECN 3020 - Intermediate Macroeconomics (3)
- ECN 3030 - Managerial Economics (3)
- ECN 3040 - Consumer and Welfare Economics (3)
- ECN 4050 - Econometrics (3)
- ECN 4180 - Seminar in Economic Policy (3)

Complete ACHIEVE courses (0 credits)

- SBC 1990 - ACHIEVE I (0) (to be taken during the freshman year or first year as an Economics BS major)
- SBC 2990 - ACHIEVE II (0) (to be taken during the fall semester of the sophomore year or the second semester as an Economics BS major)
- ECN 3990 - ACHIEVE III - Business Economics (0) (to be taken during the second semester of the sophomore year or the third semester

Electives (12 credits)

Choose four economics electives at the 3000 level or above. ECN 4010 cannot count as an elective. Students taking ECN 1500 or ECN 1600 before ECN 2010 or ECN 2020 (or ECN 2000) and who subsequently become economics majors, should talk to the department chairperson. QMM 4520 can be substituted for an economics elective. No more than three credits in ECN 3800, ECN 4900, or ECN 4996 may be counted as economic electives.

General electives (28 or more credits)

124 total credits

In addition, each student seeking a B.S. with a major in economics must:

1. Complete at least 45 credits at Oakland University, of which at least 16 credits must be offered by the SBA. Of these 16 credits, at least 12 must be in the student's majo

2. Completion of the following courses, or their equivalents, with a grade of C or better in each course: MTH 1221, MTH 1222; MIS 1000 (or CSI 1300); ECN 2010 and ECN 2020 (or ECN 2000); and QMM 240

3. Complete ECN 3020, ECN 3030, and ECN 3040 with a minimum grade of C in each course;

4. Complete at least 32 credits at the 3000 level or above;

5. Take the last eight credits needed to complete the baccalaureate requirements at Oakland University;

6. Earn a cumulative grade point average of at least 2.00 in courses taken at Oakland University and in courses taken in the School of Business Administration.

Economics Minor

The economics faculty believes strongly in its role as a provider of education in economics to a broad range of students in other majors. Even moderate contact with the concepts and applications of economics will be valuable to most students. The minor in economics provides recognition to the student who does not want a major in economics but who has taken several courses in the area.

This minor is open to all students except economics and business economics majors.

The minor in economics consists of a minimum of three courses in economics courses including any prerequisites for these courses. (ACS 4660 may satisfy three credits toward the Economics minor).

*Students on previous catalog can use ACS 4660 toward Economic Minor.

Students taking ECN 1500 or ECN 1600 before ECN 2010 or ECN 2020 (or ECN 2000) who subsequently want to minor in economics should talk to the minor coordinator.

Requirements for a liberal arts minor in economics

1. Required course(s)

- ECN 2010 - Principles of Microeconomics (4) and ECN 2020 - Principles of Global Macroeconomics (4) (or ECN 2000 - Principles of Macroeconomics (4))

2. 12 credits in any 3000 or 4000 level economics (ECN) courses

Note

A minimum grade of C must be earned in each course in the economics minor and in the prerequisites for each course.

Economics Secondary Teaching Minor

Requirements for the secondary teaching minor in economics

A minimum of 20 credits in economics and business is required for the secondary teaching minor in economics, distributed as follows:

1. Required courses

- ECN 2010 - Principles of Microeconomics (4)
- ECN 2020 - Principles of Global Macroeconomics (4) (or ECN 2000)
- ECN 3730 - International Trade (3)
- ECN 3760 - U.S. and World Economic History (3)
- ECN 3210 - Financial Markets and Economy (3)
- MIS 1000 - Business Problem Solving with Information Technology (3)

2. Required methods course

- SED 4100 - ST: Teaching Secondary in the Minor Methods (4)

Note

Students are advised to take MIS 1000 early in the education program, as the course is likely to be helpful in many courses involving information technology. They should also obtain a supplemental course pack (that covers issue analysis) from the secondary education minor adviser in the department.

Generally, application to OU STEP requires a minimum cumulative grade point average of 3.0 in courses in the major and the minor. To progress into the internship year, students admitted to the OU STEP must maintain a minimum GPA of 3.00 in both their major and minor coursework, with no single course grade below C.

Second undergraduate degree candidates completing the minor may be required to take additional courses at Oakland University beyond the stated minimums. Students should consult with the chair in the Department of Economics or with the College of Arts and Sciences advising office.

School of Education and Human Services (SEHS)

Elementary Education, B.S.

Students who wish to pursue an elementary education major are admitted with pre-elementary education status. Students who hold a baccalaureate degree in another discipline seeking a second undergraduate degree must meet the undergraduate degree program requirements, excluding General Education Requirements. After admission, students meet for course selection with Academic Advisers in the SEHS Advising Office.

Admission to the major

Admission to major standing in Elementary Education is required before taking professional education courses. Elementary education students plan their course work with an adviser in the SEHS Advising Office. Students using this catalog to meet major requirements may also use any course subsequently approved as satisfying requirements and published in a later catalog.

The program seeks students who are committed to teaching in diverse schools or districts. Meeting the minimum course requirements does not guarantee admission to the major. Qualitative criteria may be required as well. Underrepresented students are especially encouraged to apply. Minimum criteria for admission to the elementary education major are:

1. A cumulative grade-point average (GPA) of 2.80 or higher at Oakland University

2. Complete EED 2000 with a minimum grade of B

3. Complete or place out of MTH 0662 with a minimum grade of C

4. Complete WRT 1060 with a minimum grade of B

5. Read and sign, acknowledging a duty to uphold the Michigan Code of Educational Ethics

6. Submission of a completed major standing application to the SEHS Advising Office.

Students can apply for major standing once they are registered for EED 2000.

Major standing will be approved pending successful completion of all requirements.

Schedule of Classes

Requirements for the major in elementary education, B.S.

Admission to major standing is required before beginning the professional sequence Students using this catalog to meet major requirements may also use any course subsequently approved as satisfying requirements and published in a later catalog.

General Education courses

General Education requirements: In order to graduate on-schedule without taking additional courses, it is highly recommended that students meet with an Undergraduate Academic Adviser concerning the selection of all of their general education courses.

Each candidate for an Oakland University baccalaureate will need to satisfactorily complete approved courses in each of the following areas: Foundation, Exploration, Integration, Writing, and U.S. Diversity. For details, refer to the General Education section of the catalog.

In order to satisfy both general education and other program requirements, students are recommended, but not required, to select from the General Education designated courses listed below:

Foundation:

- WRT 1060 - Composition II
- Formal Reasoning - MTE 2111- Mathematics for Elementary Education II

Exploration:

- Arts - THA 1000- Introduction to Theatre
- Language and Culture - LIN 1101- The Humanity of Language
- Global Perspective - GEO 2000 Global Human Systems

- Literature - choose any approved course

- Natural Science and Technology - BIO 1002 Human Biology or PHY 1060 Earth Science

- Social Science- PS 1100 - Introduction to American Politics

- Western Civilization - HST 1100- Introduction to American History Before 1877 or HST 1200 Introduction to American History Since 1877

Integration:

- Knowledge Application - JRN 2000 Introduction to Journalism and News Writing, WRT 3062 Writing Center Studies and Tutoring Practice, WRT 3064 Writing About Culture: Ethnography, or WRT 3086 Workshop in Creative Non-Fiction (these classes also satisfy the Writing Intensive in General Education requirement)

- Writing Intensive in Major and U.S. Diversity General Education requirements are met with EED 3100

To earn the BS degree, students must:

- Complete a minimum of 120 credits

A minimum of 32 credits must be completed at Oakland University

A minimum of 32 credits must be at the 3000 level or above

- Meet University General Education Requirements

Earn a minimum grade of C in each general education course

Earn a minimum grade of B in WRT 1060 Composition II

- Complete the pre-professional and professional education coursework with B or better in each course unless otherwise noted

Pre-professional courses

- EED 1000 - Careers in Teaching (1)

- EED 2000 - Teaching, Learning, and Schools (3)

- EED 2400 - Science for the Elementary Teacher (3)

- EED 2500 - Social Studies for the Elementary Teacher (3)

- MTE 2110 - Mathematics for Elementary Education I (3) (with a minimum grade of C)

- MTE 2111 - Mathematics for Elementary Education II (4) (Formal Reasoning) (with a minimum grade of C)
- RDG 2200 - Literature for Children (3)

Professional education courses

- EED 3100 - Teaching and Learning for Equity, Diversity and Inclusion (3)
- EED 3150 - How People Learn (3)
- EED 3300 - Teaching Mathematics 1 (3)
- EED 3350 - Teaching Mathematics 2 (3)
- EED 3450 - Teaching Science 1 (3)
- EED 3500 - Teaching Social Studies 1 (3)
- EED 3600 - Seminar 1 - The Productive Classroom (3)
- EED 3650 - Seminar 2 - Teaching Diverse Students (3)
- EED 4300 - Teaching Mathematics 3 (3)
- EED 4400 - Teaching Science 2 (3)
- EED 4500 - Teaching Social Studies 2 (3)
- EED 4600 - Seminar 3 - Reflecting on my Practice (3)
- EED 4650 - Seminar 4 - Putting it all Together (3)
- EED 4950 - Internship in Elementary Education (9 to 12)
- RDG 3200 - Emergent Literacy (3)
- RDG 3250 - Beginning Literacy (3)
- RDG 4200 - Almost Fluent and Fluent Literacy (3)

Program notes

In order to be recommended for a Michigan Teaching Certificate, in addition to the B.S.

requirements, candidates must successfully complete their assigned Michigan Tests for Teacher

Certification and be in compliance with all legal requirements for Michigan certification. Link to

Department of Teacher Development and Educational Studies for more details.

Secondary Education, OU STEP

Program description

The School of Education and Human Services (SEHS) and the College of Arts and Sciences (CAS) offer a fifth-year secondary teacher education program (OU STEP) leading to recommendation for Michigan secondary standard teacher certification. After completing the requirements for graduation in their major and minor teaching areas and preliminary professional education course work, students engage in an academic year-long internship in the public schools that includes both courses and field experiences, and fulfills requirements for Michigan teacher certification. This certification is valid for teaching content areas in grades 6-12 for English, mathematics, biology, physics, chemistry, integrated science, history, and social studies.

Admission to the major

Admission to the Secondary Teacher Education Program is required before taking professional education courses. Students plan their education course work with an adviser in the SEHS Advising Office. Students using this catalog to meet major requirements may also use any course subsequently approved as satisfying requirements and published in a later catalog.

Meeting the minimum requirements does not guarantee admission to the major. Qualitative criteria may be required as well. The program seeks students who are committed to teaching in diverse schools or districts. Underrepresented students are especially encouraged to apply. Minimum criteria for admission to the elementary education major are:

Admission to the Secondary Teacher Education Program is required before taking professional education courses. Factors considered in the applicant selection process include the following:

1. A cumulative grade-point average (GPA) of 2.80 or higher at Oakland University

2. Complete SED 3000 or 3001 with a minimum grade of B

3. Complete WRT 1060 with a minimum grade of B

4. Minimum average GPA of 3.00 in both CAS major and minor.

5. Read and sign, acknowledging a duty to uphold the Michigan Code of Educational Ethics

6. Submission STEP application to the SEHS Advising Office.

Additional information or an interview may be requested to provide a more complete application profile.

Second undergraduate degree applicants should note that admission to the OU STEP and to the university involve separate processes and should contact the undergraduate admissions office for information about admission to Oakland.

Applications to the OU STEP are considered once per year. The deadline is October 1 of the year preceding the intended internship year. Applications received after that date may be considered pending review by faculty and space in the program. Applications are available on the SEHS website oakland.edu/teach.

Schedule of Classes

Program requirements

Both Oakland undergraduates and students who have completed undergraduate degrees from Oakland or other universities (second undergraduate degree candidates) may become eligible to enter OU STEP. Both groups must fulfill all Oakland requirements for a baccalaureate degree in an approved major (listed above) prior to beginning their internship year. In addition, they must complete a teaching minor in one of the following areas: biology, chemistry, economics, English, English as a second language, history, mathematics, physics, or political science unless they are completing an endorsement in social studies or integrated science. For details on specific major and minor course requirements and social studies and integrated science endorsements, consult the applicable College of Arts and Sciences departmental listings in this catalog.

The program requires 36 credits of professional education coursework. Program coursework includes courses which are taken prior to the start of the internship year, and which may be taken while students are completing their other degree requirements. A minimum overall GPA of 2.80 is required before students can begin the professional sequence.

Courses to be taken prior to application to the Secondary Teacher Education Program

SED 3000 - Introduction to Secondary Education (4) or SED 3001 - Public Education for Prospective K-12 Teachers (2)

(includes a 30-hour field assignment in the major in addition to course time.)

SED 3000 may only be retaken once. A minimum grade of a B is required for STEP application. Must be completed no less than one semester before application to STEP.

Pedagogy and field courses to be taken during the STEP Program:

- DLL 4197 Digital Technologies in the Secondary Classroom (4)
- FE 3010 - Educational Psychology for K-12 Educators (4) (includes a required field experience)

- RDG 4238 - Disciplinary Literacies (4) (includes a required field experience)

- SED 4100 - ST: Teaching Secondary in the Minor Methods (4) (includes a required field experience in minor) or SED 4130 Teaching in Your Minor Field: Mathematics (4) (includes a required field experience in minor). Students minoring in ESL are exempt from SED 4100.

- SE 4401 - Introduction to Students with Special Needs (4)

- SED 4200 - ST: Teaching Secondary of the Major Methods (4)

- SED 4951 Internship I: Pre-Student Teaching (4)

- SED 4952 Internship in Secondary Education (8)

Additional professional course requirements for Modern Language majors:

- EED 3001 Managing the Classroom Community for U.S. Diverse Learners

- EED 4240 Foreign Language Teaching Methods in Elementary and Middle School

Professional program

Retention in the program is based on student demonstration of the characteristics, dispositions, skills, and conduct of members of the teaching profession.

Retention in the SEHS professional education programs

Follow link to Teacher Development and Educational Studies homepage

Internship and certification

To progress into the internship year, students admitted to the OU STEP must maintain a minimum GPA of 3.00 in their education coursework and in their major and minor course-work. In addition, no single education course grade may be below B and no major or minor course below C. All major and minor coursework and all professional coursework (except DLL 4197, SED 4200, SED 4951 and SED 4952) must be satisfactorily completed before the internship year begins. Modern Language coursework applicable here include DLL 4197, EED 4240, SED 4200, SED 4951 and SED 4952.

Students must pass the MTTC subject area test for each content area in which they plan to be certified. Successful completion of both of these tests must be documented prior to the beginning of SED 4952.

In addition, students must receive a minimum grade of a B in SED 4951 and SED 4952 to be eligible for recommendation by Oakland University for Teacher certification. The State also requires a certificate in first aid and adult/child CPR before certification may be recommended. Students may be required to be fingerprinted and have a state police and FBI background check, at their expense, before beginning a field placement depending on school district requirements.

Successful completion of the STEP program and internship does not guarantee certification by the State of Michigan. Applicants should be aware that a conviction for a felony or a misdemeanor may constitute grounds for denial of a teaching certificate by the State of Michigan. (See complete policy on the SEHS School and Field Services web site.)

Human Resource Development, B.S.

Requirements for the major in Human Resource Development, B.S. program

Students are admitted to the Human Resource Development program with pre-HRD status until they have met the major standing requirements. Admission to pre-HRD status requires a cumulative grade-point average of 2.00 or better. Students using this catalog to meet major or minor requirements may also use any course subsequently approved as satisfying requirements and published in a later catalog.

Admission to Major Standing in Human Resource Development

To be admitted to major standing a student must satisfy the following requirements:

1. Complete a minimum of 40 credits at an accredited college or university with a cumulative GPA of 2.00 or better. Courses that carry no numerical or letter grade (such as S/U) are excluded from calculation of the GPA.

2. Complete the HRD core courses with a minimum grade of C+ in each course.

3. Submit an "Application for Major Standing" during the semester in which the student expects to complete the core requirements.

4. Meet with the HRD Academic Adviser and complete an approved HRD program plan.

Schedule of Classes

To earn a Bachelor of Science degree with a major in human resource development, students must:

1. Complete a minimum total of 120 credits.

2. Complete at least 32 credits in courses at the 3000 level or above at Oakland University.

3. Have a cumulative grade point average of at least 2.00.

4. Complete the university general education requirement (see Undergraduate degree requirements). Each candidate for an Oakland University baccalaureate will need to satisfactorily complete approved courses in each of the following areas: Foundation, Exploration, Integration, Writing, and U.S. Diversity.

5. Complete the human resource development core (32 credits), human resource development focus area courses (32 credits), internship or approved alternative (4 credits), and general electives (12 credits). Students must obtain a minimum grade of C+ in each required HRD course.

Required courses for the Bachelor of Science degree in Human Resource Development

The program leading to the Bachelor of Science degree in human resource development includes the following HRD courses, electives and internship.

A. HRD Core Courses -- 32 credits

Core courses introduce important theoretical constructs and skills for pursuing a major in human resource development. Students must earn a minimum grade of C+ in each of the following core courses:

- HRD 3100 - Introduction to Human Resource Development (4)
- HRD 3210 - Group/Team Development and Leadership (4)
- HRD 3300 - Instructional Design (4)
- HRD 3410 - Ethics in Human Resource Development (4)
- HRD 3420 - Work and the Law (4)
- HRD 3430 - Staffing, Performance Evaluation and Interaction within Organizations (4)
- HRD 3530 - Cultural Diversity in the Workplace (4)
- HRD 3700 - Human Resource Information Systems (4)

B. HRD Focus Area Courses -- 32 credits

HRD focus area courses should be taken after students finish the HRD core courses. HRD focus area courses must be completed with a minimum grade of C+. There are four HRD focus areas: Organizational Development, Training and Development, Career/Leadership Development and Employment Systems and Standards. The student is required to take the asterisked (*) course in each of the four HRD focus areas plus one elective course in each of the four HRD focus areas.

Organizational Development

- * HRD 4200 - Change Process and Organizational Analysis (4)
- HRD 3230 - Fundamentals of Human Interaction (4)
- HRD 3600 - Lean Principles and Practices in Organizations (4)

- HRD 4100 - Strategic Planning (4)
- HRD 4600 - Lean Kaizen in Organizations (4)

Training & Development

- * HRD 4300 - Instructional Methods (4)
- HRD 3330 - Presentation and Facilitation (4)
- HRD 4320 - Program Evaluation (4)
- HRD 4700 - E-learning in Organizations (4)

Career/Leadership Development

- * HRD 3520 - Career Development (4)
- HRD 3510 - Principles of Leadership (4)
- HRD 4510 - Negotiation for Personal Success (4)

Employment Systems & Standards

- * HRD 3440 - Introduction to Labor and Employment Relations (4)
- HRD 3445 - Introduction to Public Sector Labor and Employment Relations (4)
- HRD 4410 - The Study of Labor and Work Organizations (4)
- HRD 4430 - Collective Bargaining and Dispute Resolution (4)
- HRD 4420 - Employee Benefits (4)
- HRD 4440 - Civil Rights and Regulations in Employment (4)

C. General Elective Courses -- 12 credits

The general electives allow students to take courses that support their individual interests and career aspirations. General elective courses must be numbered 0500 or higher, and may be from HRD or any other field of interest.

D. Human Resource Development Internship -- 4 credits

Internship requirements may be met by the completion of a professional internship, a research internship, a project internship, or a combination of two or three of these options. Applications for internships must be submitted by the designated deadlines (fall semester - June 15, winter semester -

October 15 and summer semester - February 15). Applications will not be accepted after the deadline. The internship must be completed with a minimum grade of C+.

Professional internship (see prerequisites below in HRD 4950 course description)

In order for a student to complete a professional internship, four credits must be completed at an approved internship placement site for a total of 320 hours of work in the field of human resource development. HRD 4950 - Internship in HRD (4)

Research internship

In the rare case that a professional internship cannot be completed, a research internship of four credits may be completed by students who have the requisite backgrounds and skills to produce research work at the undergraduate level in the field of human resource development. To qualify for a research internship, students are required to have successfully completed the courses normally required for an HRD internship plus any additional courses appropriate for the acquisition of skills necessary for completion of the internship project(s).

It is required that a student intending to pursue this internship has previously conferred with an HRD faculty member regarding the availability of an appropriate research project and the willingness of the HRD faculty member to supervise the intern in his or her completion of the research project.

Students wishing to pursue a research internship must complete an application, including describing the proposed research internship. This form must also be signed by the HRD faculty member who has agreed to supervise the student. Completed applications must be submitted no later than the dates designated above for internship approval. Applications will be reviewed by a committee of the Department of Organizational Leadership.

Project internship

A project internship of four credits may be completed by students who have completed a minimum of two (2) years of work in the field of Human Resources or who are subject to special circumstances. To qualify for a project internship, students are required to have successfully completed the courses normally required for an HRD internship plus any additional courses appropriate for the acquisition of skills necessary for completion of the internship project(s).

It is required that a student intending to pursue a project internship has previously conferred with an HRD faculty member regarding the availability of an appropriate project or projects to complete as part of the internship and the willingness of the HRD faculty member to supervise the intern.

Applications must be obtained from the HRD Internship Coordinator. Completed applications must be submitted no later than the dates designated above for the internship approval. Applications will be reviewed by a committee of the Department of Organizational Leadership.

Applied Leadership Skills Minor

The minor in Applied Leadership Skills provides an academic background emphasizing education in leadership, group dynamics and interpersonal processes, ethics, multicultural leadership, and leadership in organizations from a cross-disciplinary approach. This minor is intended for students who wish to develop knowledge of leadership and to develop practical leadership abilities. This minor may be useful to students interested in expanding their leadership capabilities within their communities, businesses, or other organizations

Requirements for the minor in applied leadership skills

No more than eight credits of course work used to satisfy another major, minor, or concentration may be applied toward this minor. Students must meet with an academic adviser to design a plan and complete a Minor Authorization Form identifying appropriately selected courses. The minor requires a minimum of 23 credits distributed among the areas described below. The student must earn a final course grade of C+ or higher in a course in order for the class to be counted for the minor.

a. Core Leadership Principles -- Must complete one of the following courses

- COM 3402 - Communication in Leadership (4)
- HRD 3510 - Principles of Leadership (4)

b. Group Dynamics/Interpersonal Processes in Leadership -- Must complete two of the following courses

- COM 2403 - Group Dynamics and Communication (4)
- COM 3000 - Relational Communication Theory (4)
- COM 3400 - Relational Communication (4)
- HRD 3210 - Group/Team Development and Leadership (4)
- HRD 3230 - Fundamentals of Human Interaction (4)
- ORG 4310 - Leadership and Group Performance (4)

c. Ethics in Leadership -- Must complete one of the following courses

- PHL 3510 - Ethics in Business (4)
- PS 3710 - International Politics of Human Rights (4)
- HRD 3410 - Ethics in Human Resource Development (4)

d. Multicultural Leadership -- Must complete one of the following courses

- PS 3550 - Politics of Development (4)

- HRD 3530 - Cultural Diversity in the Workplace (4)
- COM 3300 - Multicultural Communication (4)

e. Leadership in Organizations -- Must complete one of the following courses

- HRD 3440 - Introduction to Labor and Employment Relations (4)
- HRD 4200 - Change Process and Organizational Analysis (4)
- MGT 3000 - Survey of Management (3)
- ORG 3300 - Introduction to Organizational Behavior (3)
- PS 3205 - American Political Culture (4)

Additional Information

Students should plan their coursework in a way that allows them to meet any of the prerequisites for the above courses. In particular, students are urged to take the following general education courses: PHL 1300, PS 1600 or PS 1100, and any foreign language. Study abroad opportunity through International Education may serve as a substitution for one or more of the course requirements, as determined by the HRD faculty (See Director of International Education for opportunities).

Employment Systems and Standards Minor

Employment Systems and Standards provides the practical and theoretical bases of the employee/employer relationship, with and without collective bargaining. This program may be particularly useful to individuals interested in the operational aspects of employment, including the law, collective bargaining, employment philosophy, regulations and practices, and the dynamics of employment-related leadership and participative roles.

Requirements for the minor in employment systems and standards

This minor is open to all students. Those who seek to apply credits toward a degree must contact an academic adviser to design a degree plan and to select appropriate courses; the plan of study is subject to the approval of an academic adviser. This minor requires 23 or 24 credits distributed among the areas of preparation listed below. The student must earn a final course grade of C+ or higher in each of the required courses in order for the class to be counted for the minor.

The courses for the minor in Employment Systems and Standards are as follows (23 or 24 credits):

a. Must complete one of the following

- HRD 3440 - Introduction to Labor and Employment Relations (4)
- HRD 3445 - Introduction to Public Sector Labor and Employment Relations (4)

b. Must complete the following two courses

- HRD 3420 - Work and the Law (4)
- HRD 4440 - Civil Rights and Regulations in Employment (4)

c. Must complete three of the following courses

- EHS 2350 - Occupational Safety and Health Standards (3)
- HRD 3330 - Presentation and Facilitation (4)
- HRD 3530 - Cultural Diversity in the Workplace (4)
- HRD 4100 - Strategic Planning (4)
- HRD 4410 - The Study of Labor and Work Organizations (4)
- HRD 4420 - Employee Benefits (4)
- HRD 4430 - Collective Bargaining and Dispute Resolution (4)
- HRD 4510 - Negotiation for Personal Success (4)
- WGS 3880 - Women in Modern America (4)

Human Resources Management Minor

The minor in human resources management consists of a minimum of five courses described as follows: ORG 3300, ORG 3310 and ORG 4340 and two courses chosen from ORG 4300, ORG 4310, ORG 4320, ORG 4330, ORG 4600, ORG 4700, ORG 4900 and the prerequisites for these courses. A minimum grade of C must be earned in each course in the human resources management minor and in the prerequisites for each course. This minor is open to all students except SBA human resources management majors.

Students who have taken ORG 4600 under a previous catalog will be able to count this course as an elective.

Lean Leadership Minor

Lean leadership is a specialized minor for students who want to enhance their career opportunities through lean knowledge, practice and leadership in the workplace. Students may use the minor to receive a Lean Green Belt Certificate.

Requirements for minor in Lean Leadership

All students interested in pursuing the minor must meet with an academic adviser in HRD. The minor requires 22 credits.The student must earn a final course grade of C+ or higher in each of the required courses in order for the class to be counted for the minor.

- HRD 3210 - Group/Team Development and Leadership (4)
- HRD 3510 - Principles of Leadership (4)
- HRD 3600 - Lean Principles and Practices in Organizations (4)
- HRD 4200 - Change Process and Organizational Analysis (4)
- HRD 4600 - Lean Kaizen in Organizations (4)
- HRD 4610 - Lean Green Belt Certificate (2)

Training and Development Minor

The minor in Training and Development provides students with academic and practical knowledge, skills, and classroom experience specifically in the areas of training and development, adult education, and instructional design. This program may be particularly useful to those with a general interest in designing, developing and delivering training and other presentations in their respective fields.

Requirements - Minor in Training and Development

This minor is open to all students. Those who seek to apply credits toward a degree must contact an academic adviser to design a degree plan and to select appropriate courses; the plan of study is subject to the approval of an academic adviser. The minor requires 24 credits. The student must earn a final course grade of C+ or higher in each of the required courses in order for the class to be counted for the minor.

Courses

- HRD 3100 - Introduction to Human Resource Development (4)
- HRD 3300 - Instructional Design (4)
- HRD 3330 - Presentation and Facilitation (4)
- HRD 4300 - Instructional Methods (4)

- HRD 4320 - Program Evaluation (4)
- HRD 4700 - E-learning in Organizations (4)

School of Engineering and Computer Science (SECS)

Bioengineering, B.S.

Requirements for bioengineering, B.S.

In order to earn the degree of Bachelor of Science with a major in Bioengineering, students must complete a minimum of 129 credits including satisfying general education requirements. Bioengineering students must also complete all listed requirements for the following sections: Mathematics & Sciences, Engineering Core, and Required Professional Subjects.

Students will also broaden their knowledge in a specific area of Bioengineering by completing elective courses in the professional tracks requirement.

Students in this program are not required to complete the College of Arts and Sciences exploratory requirements but must complete the General Education Requirements including capstone and writing intensive courses.

General education - 28 credits

The General Education Requirements are comprised of three parts: Foundations, Explorations, and Integration. In addition, U.S. Diversity requirements must also be met. For details, refer to the General Education section of the catalog. In order to satisfy both general education and other program requirements, in some of the general education areas students should select from the courses listed below:

Foundations:

- Writing Foundations (WRT 1060)
- Formal Reasoning (satisfied by MTH 1554; see Mathematics and sciences section)

Explorations: One course from each of the seven Explorations areas:

- Arts

- Language and Culture
- Global Perspective
- Literature
- Natural Science and Technology (satisfied by EGR 2400 or EGR 2500; see Engineering Core)
- Social Science (satisfied by ECN 1500, ECN 2010, or ECN 2020; see Additional Major Requirements)
- Western Civilization (satisfied by PHL 1310 - Introduction to Ethics in Science and Engineering; see Additional Major Requirements)

Integration:

- Knowledge Applications (satisfied by MTH 1555, see Mathematics and Sciences)
- Capstone (satisfied by BE 4999; see Required professional subjects)

U.S. Diversity:

- May be met by an approved course in the Explorations area

Writing Intensive:

- Writing Intensive in the Major (satisfied by BE 4999; see Required Professional Subjects)
- Writing Intensive in General Education (may be met by an approved course in the Explorations area)

Additional Major Requirements:

All bioengineering students must meet the following requirements. Courses from these selections can meet general education exploration areas above.

- Professional Ethics: PHL 1310 - Introduction to Ethics in Science and Engineering
- Economics: Choose one from ECN 1500, ECN 2010, or ECN 2020

Mathematics and Sciences

- MTH 1554 - Calculus I (4)
- MTH 1555 - Calculus II (4)
- APM 2555 - Introduction to Differential Equations with Matrix Algebra (4)

- MTH 2554 - Multivariable Calculus (4) or APM 2663 - Discrete Mathematics (4)
- BIO 1200 - Biology I (4)
- BIO 1201 - Biology Laboratory (1)
- BIO 2600 - Human Physiology (4)
- BIO 3621 - Physiology Laboratory (1)
- PHY 1610 - Fundamentals of Physics I (4)
- PHY 1620 - Fundamentals of Physics II (4)
- PHY 3250 - Biological Physics (4)
- CHM 1440 - General Chemistry I (4) and CHM 1470 - General Chemistry Laboratory I (1)
- CHM 1450 - General Chemistry II (4) and CHM 1480 - General Chemistry Laboratory II (1)
- CHM 2340 - Organic Chemistry I (4)

Engineering Core

- EGR 1200 - Engineering Graphics and CAD (1)
- EGR 1400 - Computer Problem Solving in Engineering and Computer Science (4)
- EGR 2400 - Introduction to Electrical and Computer Engineering (4)
- EGR 2500 - Introduction to Thermal Engineering (4)
- EGR 2600 - Introduction to Industrial and Systems Engineering (4)
- EGR 2800 - Design and Analysis of Electromechanical Systems (4)

Required Professional Subjects

- BE 3150 - Bioinstrumentation (4)
- BE 3899 - Introduction to Engineering Biology (4)
- BE 4999 - Research Project/Capstone Design (4)

Professional Tracks

Students must complete 16 credits of elective courses from the professional tracks below. Courses can be selected from within one track if the student has a particular area of interest or any combination of courses listed under different tracks. A minimum of 12 credits used toward the professional track requirement must be from courses with engineering-based material.

Track 1: Biomedical Imaging and Signal Processing

- BE 4100 - Biomedical Signal Processing (4)
- BE 4110 - Medical Imaging (4)
- BE 4120 - Medical Image Analysis (4)
- PHY 3260 - Medical Physics (4)

Track 2: Bioinformatics and Genome Engineering

- BE 4200 - Genetic and Genomic Engineering (4)
- BIO 4412 - Functional Genomics and Bioinformatics (4)
- CSI 3450 - Database Design and Implementation (4)
- CSI 4780 - Bioinformatics (4)

Track 3: Molecular Engineering

- BE 4300 - Bioprocess Engineering (4)
- BIO 3500 - General Microbiology (4) *
- BIO 4550 - Microbial Biotechnology (4)
- ME 3500 - Introduction to Fluid and Thermal Energy Transport (4)

* This course does not satisfy the engineering-based material requirement

Track 4: Tissue Engineering

- BE 4400 - Tissue Engineering (4)
- BIO 3142 - Bioengineering Organs and Tissues (4)
- ME 3250 - Mechanics of Materials (4)
- ME 4210 - Analysis and Design of Mechanical Structures (4)

- BE 4900, BE 4996 and BE 4998 may also be selected to meet curriculum requirements. Prior approval is required to take these courses.

No Track Option

- Any 16 credits chosen from the tracks above. A minimum of 12 credits must be engineering-based material

Major Standing

To enroll in 3000 or higher-level courses and to become candidates for the B.S. in Bioengineering, students must gain major standing. An application for major standing should be submitted prior to intended enrollment in 3000 or higher-level courses. Forms may be obtained from the SECS Undergraduate advising office or from the SECS website. At the time that major standing is approved, students with majors of Pre-Bioengineering will have their major changed to Bioengineering. Approval of both a major standing application and change of major to Bioengineering is required prior to enrolling in any 3000- or higher-level courses.

To gain major standing and be considered for a degree in Bioengineering, students must:

A) have an average of at least C in the following mathematics and sciences courses: BIO 1200, BIO 1201, MTH 1554, MTH 1555, APM 2555, CHM 1440 and PHY 1610.

B) have an average of at least C in the following engineering core courses: EGR 1200, EGR 1400, EGR 2400, EGR 2500, EGR 2600 and EGR 2800.

C) have no more than two grades below C in the courses listed in A and B above

D) have not attempted any course listed in A and B above more than three times.

E) have not repeated more than three different courses listed in A and B. Courses in which a W (withdrawal) grade is recorded will not be counted

Conditional major standing may be granted in the semester in which the student will complete the courses listed in A and B above.

Performance requirements

Satisfactory completion of the program requires a GPA of at least 2.0 within each group: mathematics and sciences, engineering core, required professional subjects, and professional tracks and a grade of C or better in the research project/capstone design course (BE 4999). For required professional subjects and professional track courses, at most two grades below C are permitted, at most two different courses may be repeated, and a total of three attempts per course are permitted.

Sample Bioengineering schedule

Students may follow a schedule such as the one indicated below

Freshman year

Fall semester - 17 credits

- BIO 1200 - Biology I (4)
- BIO 1201 - Biology Laboratory (1)
- EGR 1400 - Computer Problem Solving in Engineering and Computer Science (4)
- MTH 1554 - Calculus I (4)
- General Education (4)

Winter semester - 17 credits

- EGR 1200 - Engineering Graphics and CAD (1)
- EGR 2400 - Introduction to Electrical and Computer Engineering (4)
- MTH 1555 - Calculus II (4)
- PHY 1610 - Fundamentals of Physics I (4)
- General Education (4)

Sophomore year

Fall semester - 17 credits

- APM 2555 - Introduction to Differential Equations with Matrix Algebra (4)
- CHM 1440 - General Chemistry I (4)
- CHM 1470 - General Chemistry Laboratory I (1)
- EGR 2600 - Introduction to Industrial and Systems Engineering (4)
- General Education (4)

Winter semester - 16 credits

- EGR 2500 - Introduction to Thermal Engineering (4)
- EGR 2800 - Design and Analysis of Electromechanical Systems (4)
- MTH 2554 - Multivariable Calculus (4) or APM 2663 - Discrete Mathematics (4)

- General Education (4)

Junior year

Fall semester - 17 credits

- CHM 1450 - General Chemistry II (4)
- CHM 1480 - General Chemistry Laboratory II (1)
- BE 3150 - Bioinstrumentation (4)
- BE 3899 - Introduction to Engineering Biology (4)
- General Education (4)

Winter semester - 17 credits

- BIO 2600 - Human Physiology (4)
- BIO 3621 - Physiology Laboratory (1)
- CHM 2340 - Organic Chemistry I (4)
- PHY 1620 - Fundamentals of Physics II (4)
- General Education (4)

Senior year

Fall semester -16 credits

- Professional track (4)
- Professional track (4)
- Professional track (4)
- General Education (4)

Winter semester - 12 credits

- BE 4999 - Research Project/Capstone Design (4)
- PHY 3250 - Biological Physics (4)
- Professional track (4)

Computer Science, B.S.

Requirements for the major in computer science, B.S. program

The program in computer science leading to a Bachelor of Science degree prepares students for a productive career in industry, and for graduate study in computer science. The program prepares the students for a productive career in industry by providing them with the technical skills to formulate suitable abstractions, create novel computational solutions, design complex systems, and improve on existing solutions integrating current and emerging technologies. The program prepares the students for lifelong learning and graduate school by providing them with the theoretical foundations of information and computation and exposing them to areas of current and future developments. The program also includes a strong professional component for the development of skills in technical communication, ethics, and teamwork. The BS in Computer Science program is accredited by the Computing Accreditation Commission of ABET.

Program educational objectives

In the course of their careers, graduates of the Computer Science program will:

- Work productively in the creation, maintenance, and improvement of computing systems.
- Remain current in their profession through lifelong learning, including graduate school.
- Exhibit leadership and exercise their profession with the highest level of ethics, and social responsibility.

Course requirements (minimum of 128 total credits)

To earn the Bachelor of Science degree with a major in computer science students must complete a minimum of 128 credits and meet the following requirements:

General education

The General Education Requirements are comprised of three parts: Foundations, Explorations, and Integration. In addition, U.S. Diversity requirements must also be met. For details, refer to the General Education section of the catalog. In order to satisfy both general education and other program requirements, in some of the general education areas students should select from the courses listed below.

Foundations

- Writing Foundations (WRT 1060)
- Formal Reasoning (Satisfied by MTH 1554; see Mathematics and sciences)

Explorations: One course from each of the seven Explorations areas

- Arts
- Language and Culture
- Global Perspective
- Literature
- Natural Science and Technology (Satisfied by an approved science elective with lab; see Mathematics and Sciences)
- Social Science
- Western Civilization (Satisfied by PHL 1310; see additional major requirements)

Integration

- Knowledge Applications (Satisfied by MTH 1555; see Mathematics and sciences)

U.S. Diversity

- May be met by an approved course in the Explorations area.

Writing Intensive and Capstone

- Capstone (Satisfied by CSI 4999; see Required professional subjects)
- Writing Intensive in the Major (Satisfied by CSI 4999; see Required professional subjects)
- Writing Intensive in General Education (may be met by an approved course in the Explorations area)

Additional Major Requirements

All students must complete the following requirement.

- Professional Ethics: PHL 1310 - Introduction to Ethics in Science and Engineering

In order to graduate on-schedule without taking additional courses, it is highly recommended that students meet with an SECS Undergraduate Academic Adviser concerning the selection of all of their general education courses.

Mathematics and science

- MTH 1554 - Calculus I (4)

- MTH 1555 - Calculus II (4)
- MTH 2775 - Linear Algebra (4)
- APM 2663 - Discrete Mathematics (4)
- STA 2226 - Applied Probability and Statistics (4)
- Approved science elective with lab (5)
- Approved science elective (4)

Approved science elective with lab*

Take one of the following biology, chemistry, or physics courses with the corresponding laboratory

- BIO 1200 - Biology I (4) and BIO 1201 - Biology Laboratory (1)
- CHM 1440 - General Chemistry I (4) and CHM 1470 - General Chemistry Laboratory I (1)
- PHY 1510 - Introductory Physics I (4) and PHY 1100 - General Physics Lab I (1)

Approved science elective*

Take one additional science course from the following list

- BIO 1200 - Biology I (4)
- CHM 1430 - Chemical Principles (4)
- PHY 1610 - Fundamentals of Physics I (4)
- PHY 1620 - Fundamentals of Physics II (4)

*Students may not receive credit for both CHM 1430 and CHM 1440. Students may not receive credit for both PHY 1510 and PHY 1610.

Computer science core

- CSI 1420 - Introduction to C Programming and Unix (4)
- CSI 2300 - Object-Oriented Computing (4)
- CSI 2310 - Data Structures (4)
- CSI 2470 - Introduction to Computer Networks (4)

- CSI 2999 - Sophomore Project (2)

Required professional subjects

- CSI 3370 - Software Engineering and Practice (4)
- CSI 3430 - Theory of Computation (4)
- CSI 3450 - Database Design and Implementation (4)
- CSI 3610 - Design and Analysis of Algorithm (4)
- CSI 3640 - Computer Organization (4)
- CSI 4350 - Programming Languages (4)
- CSI 4480 - Information Security Practices (4)
- CSI 4500 - Fundamentals of Operating Systems (4)
- CSI 4650 - Parallel and Distributed Computing (4)
- CSI 4999 - Senior Capstone Project (4)

Professional track

Select two courses from one of the following professional tracks:

Computational Intelligence Track

- CSI 4130 - Artificial Intelligence (4)
- CSI 4810 - Information Retrieval and Knowledge Discovery (4)

System Administration Track

- CSI 3660 - System Administration (4)
- CSI 4660 - Advanced System Administration (4)

Bioinformatics Track

- BIO 3400 - Genetics (4)
- CSI 4780 - Bioinformatics (4)

Cybersecurity Track

- CSI 4460 - Information Security (4)
- CSI 4700 - Software Security (4)
- APM 4347 - Mathematics of Cryptology (4)

Game Development Track

- CSI 3380 - Game Design (4)
- CSI 4380 - Game Programming (4)

Mobile Applications Development Track

- CSI 3150 - Web and Mobile Systems (4)
- CSI 4230 - Mobile Application Development (4)

Web Development Track

- CSI 3150 - Web and Mobile Systems (4)
- CSI 4160 - Integrated Computing Systems (4)

Students following older catalogs will be able to count courses under one of the tracks listed above to satisfy their professional track requirements.

Professional electives

Take 5 credits from the following courses.

Any 3000, 4000, or 5000 level engineering or computer science or information technology courses. No more than 1-credit of CSI 4950 (Internship) can be used to fulfill the professional electives requirement. Courses at the 5000-level require approval of the instructor.

No more than one of the following 2000 level courses:

- CSI 2320 - C++ for Programmers (2)
- CSI 2330 - Immersive Python (2)
- CSI 2340 - Ruby for Web Developers (2)
- CSI 2350 - Programming in Visual C# for .NET Technology (2)

Any math, science or engineering elective from the following:

- APM 2555 - Introduction to Differential Equations with Matrix Algebra (4)
- APM 3332 - Applied Matrix Theory (4)
- APM 4333 - Numerical Methods (4)
- APM 4334 - Applied Numerical Methods: Matrix Methods (4)
- APM 4663 - Graph Theory and Combinatorial Mathematics (4)
- APM 4777 - Computer Algebra (4)
- EGR 2400 - Introduction to Electrical and Computer Engineering (4)
- MTH 3552 - Complex Variables (4)
- MOR 2442 - Elementary Models in Operations Research (4)
- PHY 1110 - General Physics Lab II (1)
- PHY 3250 - Biological Physics (4)
- PHY 3260 - Medical Physics (4)
- PHY 3310 - Optics (4)
- PHY 3660 - Vibrations and Waves (4)
- PHY 3710 - Foundations of Modern Physics (4)

Students who are interested in other upper level mathematical and natural sciences courses to satisfy their professional electives requirements should consult an academic adviser.

Minimum credit hour requirements in mathematics and sciences

Students must complete all five required mathematics and statistics courses for a minimum of 15 credits. Students with fewer than 15 credits of required mathematics and statistics, for example due to transfers from another institution, must take additional courses to satisfy the requirement. Any additional course must be approved by a petition of exception.

Students must complete an approved science elective and an approved science elective with lab for a minimum of 6 credits. Students with fewer than 6 credits of sciences, for example due to transfers from another institution, must take additional courses to satisfy the requirements. Any additional course must be approved by a petition of exception.

Major standing

To enroll in 3000- or higher level courses and to become candidates for the degree of Bachelor of Science with a major in Computer Science, students must gain major standing. An application for major standing should be submitted prior to intended enrollment in 3000- or higher level courses. Forms may be obtained from the SECS Undergraduate Advising Office or from the SECS website. At the time that major standing is approved, students with majors of Pre-Computer Science will have their major changed to Computer Science. Approval of both a major standing application and change of major to Computer Science is required prior to enrolling in any 3000- or higher-level courses.

To gain major standing in Computer Science, students must:

A) have an average GPA of 2.0 in the following mathematics and science courses: MTH 1554, MTH 1555, MTH 2775, APM 2663, an approved science elective, and an approved science elective with lab.

B) have an average GPA of 2.0 in the following computer science core courses: CSI 1420, CSI 2300, CSI 2310, CSI 2470, and CSI 2999.

C) have no more than two grades below C in the courses listed in A and B above.

D) have not attempted any course listed in A and B above more than three times.

E) have not repeated more than three different courses listed in A and B. Courses in which a W (withdrawal) grade is recorded will not be counted.

Conditional major standing may be granted in the semester in which the student will complete requirements A and B above.

Students who have questions about petition of exception, transfer credit, academic standing, major standing, or any other aspects of their degree programs should consult an academic adviser and other relevant sections of the undergraduate catalog.

Performance requirements

Satisfactory completion of the program requires an average grade of at least 2.0 within each group: mathematics and sciences, computer science core, and professional courses (including required professional subjects, professional electives, and professional track). Within the professional courses at most two different courses may be repeated, a total of three attempts per course is permitted, and at most two grades below C are permitted. A grade of C or better in CSI 4999 (Senior Capstone Project) must be received.

Sample computer science schedule

Students entering the School of Engineering and Computer Science with the required background may follow a schedule such as the one indicated below. However, students will need additional time to complete the program if they do not have the required background upon entrance to the program.

Freshman year

Fall semester -- 16 credits

- MTH 1554 - Calculus I (4)
- CSI 1420 - Introduction to C Programming and Unix (4)
- General education (4)
- General education (4)

Winter semester -- 17 credits

- CSI 2300 - Object-Oriented Computing (4)
- MTH 1555 - Calculus II (4)
- Approved science elective with lab (5)
- General education (4)

Sophomore year

Fall semester -- 16 credits

- APM 2663 - Discrete Mathematics (4)
- CSI 2310 - Data Structures (4)
- Approved science elective (4)
- General education (4)

Winter semester -- 18 credits

- MTH 2775 - Linear Algebra (4)
- CSI 2470 - Introduction to Computer Networks (4)
- CSI 2999 - Sophomore Project (2)
- General education (4)
- General education (4)

Junior year

Fall semester -- 16 credits

- STA 2226 - Applied Probability and Statistics (4)
- CSI 3610 - Design and Analysis of Algorithm (4)
- CSI 3640 - Computer Organization (4)
- General education (4)

Winter semester -- 16 credits

- CSI 3370 - Software Engineering and Practice (4)
- CSI 3430 - Theory of Computation (4)
- CSI 3450 - Database Design and Implementation (4)
- CSI 4650 - Parallel and Distributed Computing (4)

Senior year

Fall semester -- 16 credits

- CSI 4350 - Programming Languages (4)
- CSI 4480 - Information Security Practices (4)
- Professional elective (4)
- Professional track (4)

Winter semester -- 13 credits

- CSI 4500 - Fundamentals of Operating Systems (4)
- CSI 4999 - Senior Capstone Project (4)
- Professional elective (1)
- Professional track (4)

Information Technology, B.S.

Requirements for the major in information technology, B.S. program

The program in Information Technology (IT) leading to a bachelor of science (BS) degree prepares students for a successful professional career in IT, and for graduate study in information technology. The program provides students with the technical foundation of information technology, problem solving skills, and hands-on practice. This will help students create and improve IT solutions by integrating existing and emerging technologies. This program prepares students for graduate studies and lifelong learning by providing them with the theoretical foundations of information technology and exposing them to areas of current and future practices. The pillars of IT include programming, networking, human-computer interaction, databases, information management, and web systems, built on a foundation of knowledge of the fundamentals of IT. The program also includes a strong professional component to develop skills in technical communication, ethics, and team work. The BS in Information Technology program is accredited by the Computing Accreditation Commission of ABET.

Program educational objectives

In the course of their careers, graduates of the Information Technology program will:

- Work productively as problem solvers and providers of integrated IT solutions.

- Remain current in their profession through lifelong learning, including graduate school.

- Exhibit teamwork and leadership as well as exercise their profession with the highest level of ethics and social responsibility.

Course requirements (minimum of 128 total credits)

To earn the Bachelor of Science degree with a major in information technology, students must complete a minimum of 128 credits and meet the following requirements:

General education

The General Education Requirements are comprised of three parts: Foundations, Explorations, and Integration. In addition, U.S. Diversity requirements must also be met. For details, refer to the General Education section of the catalog. In order to satisfy both general education and other program requirements, in some of the general education areas students should select from the courses listed below.

Foundations:

- Writing Foundations (WRT 1060)

- Formal Reasoning (Satisfied by MTH 1554 or MTH 1222; see Mathematics and sciences)

Explorations: One course from each of the seven Explorations areas

- Arts

- Language and Culture
- Global Perspective
- Literature
- Natural Science and Technology (Satisfied by approved science elective; see Mathematics and sciences)
- Social Science
- Western Civilization (Satisfied by PHL 1310); see Additional Major Requirements)

Integration:

- Knowledge Applications (Satisfied by APM 1663; see Mathematics and sciences)

U.S. Diversity:

- May be met by an approved course in the Explorations area.

Writing Intensive and Capstone:

- Capstone (Satisfied by CSI 4999; see Required professional subjects)
- Writing Intensive in the Major (Satisfied by CSI 4999; see Required professional subjects)
- Writing Intensive in General Education (may be met by an approved course in the Explorations area)

Additional Major Requirements

All students must complete the following requirement.

- Professional Ethics: PHL 1310 - Introduction to Ethics in Science and Engineering

In order to graduate on-schedule without taking additional courses, it is highly recommended that students meet with an SECS Undergraduate Academic Adviser concerning the selection of all of their general education courses.

Mathematics and sciences

- MTH 1554 - Calculus I (4) or MTH 1222 - Calculus for the Social Sciences (4)
- STA 2221 - Introduction to Statistical Methods (4)
- APM 1663 - Mathematics for Information Technology (4)

- Approved science elective (4)*

*Approved science electives for information technology majors are: BIO 1200, BIO 1300, CHM 1440 and CHM 1470, ENV 3080, PHY 1510 and PHY 1100.

Information technology core

- CSI 1210 - Problem Solving Using VBA and Excel (4)
- CSI 1320 - Introduction to Python Programming and Unix (4)
- CSI 2300 - Object-Oriented Computing (4)
- CSI 2440 - Computer Systems (4)
- CSI 2470 - Introduction to Computer Networks (4)
- CSI 2999 - Sophomore Project (2)

Required professional subjects

- CSI 3150 - Web and Mobile Systems (4)
- CSI 3370 - Software Engineering and Practice (4)
- CSI 3450 - Database Design and Implementation (4)
- CSI 3500 - Human Computer Interaction (4)
- CSI 3620 - Data Structures and Algorithms (4)
- CSI 3660 - System Administration (4)
- CSI 4160 - Integrated Computing Systems (4)
- CSI 4410 - IT Project Management (4)
- CSI 4480 - Information Security Practices (4)
- CSI 4999 - Senior Capstone Project (4)

Professional track

Select two courses from one of the following professional tracks

System Administration Track

- CSI 3680 - Script Programming (4)
- CSI 4660 - Advanced System Administration (4)

Bioinformatics Track

- BIO 3400 - Genetics (4)
- CSI 4780 - Bioinformatics (4)

Game Development Track

- CSI 3380 - Game Design (4)
- CSI 4380 - Game Programming (4)

Cybersecurity Track

- CSI 4460 - Information Security (4)
- CSI 4700 - Software Security (4)

Students following older catalogs will be able to count courses under one of the tracks listed above to satisfy their professional track requirements.

Professional training

Take 2 credits from one of the following courses:

- CSI 4950 - Internship (2)
- CSI 4955 - Industrial Project (2)
- CSI 4995 - Undergraduate Research (2)

Communications

Choose one of the following courses:

- COM 2403 - Group Dynamics and Communication (4)
- COM 3401 - Communication in Organizations (4)

Professional electives

Take 8 credits from the following courses:

Select CSI 2320, CSI 2340, CSI 2350, CSI 2360, or any CSI courses at 3000 or higher level. CSI 4950 - Internship cannot be used to fulfill the professional electives requirements. Courses at the 5000-level require approval of the instructor.

Major Standing

To enroll in 3000- or higher level courses and to become candidates for the degree of Bachelor of Science with a major in Information Technology, students must gain major standing. An application for major standing should be submitted prior to intended enrollment in 3000- or higher level courses. Forms may be obtained from the SECS Undergraduate Advising Office or from the SECS website. At the time that major standing is approved, students with majors of Pre-Information Technology will have their major changed to Information Technology. Approval of both a major standing application and change of major to Information Technology is required prior to enrolling in any 3000- or higher-level courses.

To gain major standing Information Technology, students must:

A) have an average GPA of 2.0 in the following mathematics and science courses: Either MTH 1222 or MTH 1554, STA 2221, APM 1663 and approved science elective.

B) have an average GPA of 2.0 in the following information technology core courses: CSI 1210, CSI 1320, CSI 2300, CSI 2440, CSI 2470 and CSI 2999.

C) have no more than two grades below C in the courses listed in A and B above.

D) have not attempted any course listed in A and B above more than three times.

E) have not repeated more than three different courses listed in A and B. Courses in which a W (withdrawal) grade is recorded will not be counted.

Conditional major standing may be granted in the semester in which the student will complete requirements A and B above.

Students who have questions about petition of exception, transfer credit, academic standing, major standing, or any other aspects of their degree programs should consult an academic adviser and other relevant sections of the undergraduate catalog.

Performance requirements

Satisfactory completion of the program requires an average grade of at least 2.0 within each group: mathematics and sciences, information technology core, and professional courses (including required professional subjects, professional track, communications, and professional electives). Within the professional courses at most two different courses may be repeated, a total of three attempts per course is permitted, and at most two grades below C are permitted. A grade of C or better in CSI 4999 (Senior Capstone Project) must be received.

Sample information technology schedule

Students entering the School of Engineering and Computer Science with the required background may follow a schedule such as the one indicated below. However, students will need additional time to complete the program if they do not have the required background upon entrance to the program.

Freshman year

Fall semester -- 16 credits

- CSI 1320 - Introduction to Python Programming and Unix (4)
- MTH 1222 - Calculus for the Social Sciences (4) or MTH 1554 - Calculus I (4)
- General education (4)
- General education (4)

Winter semester -- 16 credits

- CSI 1210 - Problem Solving Using VBA and Excel (4)
- CSI 2300 - Object-Oriented Computing (4)
- STA 2221 - Introduction to Statistical Methods (4)
- General education (4)

Sophomore year

Fall semester -- 16 credits

- APM 1663 - Mathematics for Information Technology (4)
- CSI 2470 - Introduction to Computer Networks (4)
- General education (4)
- General education (4)

Winter semester -- 18 credits

- CSI 2440 - Computer Systems (4)
- CSI 2999 - Sophomore Project (2)
- Approved science elective (4)
- General education (4)

- General education (4)

Junior year

Fall semester -- 16 credits

- CSI 3150 - Web and Mobile Systems (4)
- CSI 3500 - Human Computer Interaction (4)
- CSI 3660 - System Administration (4)
- Communications (4)

Winter semester -- 16 credits

- CSI 3370 - Software Engineering and Practice (4)
- CSI 3450 - Database Design and Implementation (4)
- CSI 3620 - Data Structures and Algorithms (4)
- Professional track (4)

Senior year

Fall semester -- 14 credits

- CSI 4160 - Integrated Computing Systems (4)
- Professional training (2)
- Professional track (4)
- Professional elective (4)

Winter semester -- 16 credits

- CSI 4410 - IT Project Management (4)
- CSI 4480 - Information Security Practices (4)
- CSI 4999 - Senior Capstone Project (4)
- Professional elective (4)

Computer Science Minor

The minor in computer science is suitable for students with a major in engineering, mathematics, physics, chemistry or biology, who may wish to emphasize numerical, scientific and engineering aspects of computing. Students must earn a minimum of 20 credits, including the following courses:

- CSI 1320 - Introduction to Python Programming and Unix (4) or CSI 1420 - Introduction to C Programming and Unix (4)
- CSI 2300 - Object-Oriented Computing (4)
- CSI 2310 - Data Structures (4)
- And minimum 8 credits of CSI courses numbered 2000 or above.

At least 12 of these credits must be taken at Oakland University. A minimum grade of C is required in each course for this minor. Students must obtain permission from the Department of Computer Science and Engineering in order to register for CSI courses at the 3000 and 4000 levels.

Information Technology Minor

The minor in information technology is suitable for students with a major in liberal arts or business, who may wish to emphasize non-numerical and symbolic data processing aspects of computing and information technology.

For an IT minor, students must earn a minimum of 20 credits in the following courses

- CSI 1200 - Introduction to Computing and Programming using Excel (4) or CSI 1210 - Problem Solving Using VBA and Excel (4)
- CSI 1300 - Introduction to Computer Programming (4) or CSI 1320 - Introduction to Python Programming and Unix (4)

and any three courses from

- CSI 1220 - Computer Animation (4)
- CSI 2300 - Object-Oriented Computing (4)
- CSI 2470 - Introduction to Computer Networks (4)

- CSI 3150 - Web and Mobile Systems (4)

At least 12 of these credits must be taken at Oakland University

An average GPA of 2.0 is required in courses counted toward this minor. Students must obtain permission from the Department of Computer Science and Engineering in order to register for CSI courses at the 3000 and higher levels.

Computer Engineering, B.S.E.

Requirements for the major in computer engineering, B.S.E. program

Major technological advances are being made in the computer field at a rapid pace, and it is essential that computer engineering students are not only aware of these advances but prepared to work in this changing environment. Students should gain a strong background in the fundamentals of computer engineering and develop a willingness to accept and thrive on change.

The computer engineering program at Oakland University is designed to provide students with the basic knowledge and skills needed to function effectively in computer-related activities in the years ahead. It is unique in offering a focus on embedded systems. A balance between theoretical and practical experience and an emphasis on the software and hardware aspects of computers are key elements to the university's computer engineering major. The BSE in Computer Engineering program is accredited by the Engineering Accreditation Commission of ABET.

Program educational objectives

The undergraduate program in Computer Engineering will provide educational experiences aimed toward producing graduates who will:

- Become successful practitioners in an engineering or related career.

- Pursue graduate study and/or continuing education opportunities in electrical engineering, computer engineering, or other related disciplines.

- Demonstrate leadership and excel in multi-disciplinary and multi-cultural environments.

- Function as responsible members of society with an awareness of the ethical and social ramifications of their work.

Course requirements (minimum of 129 total credits)

To earn the degree of Bachelor of Science in Engineering with a major in computer engineering, students must complete a minimum of 129 credits and satisfy the writing requirements. They must meet the following requirements: (also see Undergraduate degree requirements)

General education

The General Education Requirements are comprised of three parts: Foundations, Explorations, and Integration. In addition, U.S. Diversity requirements must also be met. For details, refer to the General Education section of the catalog. In order to satisfy both general education and other program requirements, in some of the general education areas students should select from the courses listed below:

Foundations:

- Writing Foundations - WRT 1060
- Formal Reasoning (satisfied by MTH 1554; see Mathematics and sciences)

Explorations: One course from each of the seven Explorations areas:

- Arts
- Language and Culture
- Global Perspective
- Literature
- Natural Science and Technology (satisfied by EGR 2400 or EGR 2500; see engineering core)
- Social Science (satisfied by ECN 1500, ECN 2010, or ECN 2020; see Additional Major Requirements)
- Western Civilization (satisfied by PHL 1310; see Additional Major Requirements)

Integration:

- Knowledge Applications (satisfied by MTH 1555 for engineering majors; see Mathematics and sciences)
- Capstone (satisfied by ECE 4999; see Required Professional Subjects)

U.S. Diversity:

- May be met by an approved course in the Explorations area

Writing Intensive:

- Writing Intensive in the Major (satisfied by ECE 4999; see Required Professional Subjects)

- Writing Intensive in General Education (may be met by an approved course in the Explorations area)

Additional Major Requirements

All students must meet the following requirements. Courses from these selections can meet general education exploration areas above.

- Professional Ethics: PHL 1310 - Introduction to Ethics in Science and Engineering

- Economics: Choose one from ECN 1500, ECN 2010, or ECN 2020

In order to graduate on-schedule without taking additional courses, it is highly recommended that students meet with an SECS Undergraduate Academic Adviser concerning the selection of all of their general education courses.

Mathematics and sciences

- MTH 1554 - Calculus I (4)

- MTH 1555 - Calculus II (4)

- APM 2555 - Introduction to Differential Equations with Matrix Algebra (4)

- APM 2663 - Discrete Mathematics (4)

- CHM 1430 - Chemical Principles (4)

- PHY 1610 - Fundamentals of Physics I (4)

- PHY 1620 - Fundamentals of Physics II (4)

- Approved Math/Science Elective from list below (4)

Approved Math/Science Elective Options:

- APM 3332 - Applied Matrix Theory (4)

- APM 3557 - Elements Partial Differential Equations (4)

- APM 4333 - Numerical Methods (4)

- APM 4334 - Applied Numerical Methods: Matrix Methods (4)

- APM 4663 - Graph Theory and Combinatorial Mathematics (4)

- APM 4777 - Computer Algebra (4)
- BIO 1200 - Biology I (4)
- CHM 1450 - General Chemistry II (4) and CHM 1480 - General Chemistry Laboratory II (1)
- MOR 2442 - Elementary Models in Operations Research (4)
- MTH 2554 - Multivariable Calculus (4)
- MTH 2775 - Linear Algebra (4)
- MTH 3552 - Complex Variables (4)
- PHY 3250 - Biological Physics (4)
- PHY 3260 - Medical Physics (4)
- PHY 3310 - Optics (4)
- PHY 3660 - Vibrations and Waves (4)
- PHY 3710 - Foundations of Modern Physics (4)
- Or others by approval by petition to the SECS Committee on Academic Standing.

Students must complete at least 30 credits in the required math/science area. Students with fewer than 30 credit hours of math/science, for example due to transfers from another institution, must take additional courses to satisfy this requirement. Additional courses in math/science must be from the approved Math/Science Elective Options listed above.

Engineering core

- EGR 1200 - Engineering Graphics and CAD (1)
- EGR 1400 - Computer Problem Solving in Engineering and Computer Science (4)
- EGR 2400 - Introduction to Electrical and Computer Engineering (4)
- EGR 2500 - Introduction to Thermal Engineering (4)
- EGR 2600 - Introduction to Industrial and Systems Engineering (4)
- EGR 2800 - Design and Analysis of Electromechanical Systems (4)

Required professional subjects

- CSI 2290 - Introduction to Data Structures in C (4)
- ECE 2005 - Electric Circuits (4)
- ECE 2700 - Digital Logic Design (4)
- ECE 3100 - Electronic Circuits and Devices I (4)
- ECE 3204 - Signals and Systems (4)
- ECE 3720 - Microprocessors (4)
- ECE 4710 - Computer Hardware Design (4)
- ECE 4721 - Embedded Systems Design (4)
- ECE 4999 - Senior Design (4)

Professional electives

Professional elective courses can be selected from 3000, 4000, or 5000 level Electrical and Computer Engineering (ECE), Computer Science and Informatics (CSI), or approved mathematics and science electives; provided that the prerequisites of the courses are met. Professional electives from other SECS programs can be selected with prior approval of the Department of Electrical and Computer Engineering. Of the 12 professional elective credits, 4 credits must be selected from the Computers and Algorithms list, and at least 4 credits must be from a 4000 or 5000 level course. Professional electives at the 5000 level require an overall GPA of 3.0 or above. Prior approval of the chairperson of the Department of Electrical and Computer Engineering is required for ECE 4996 and ECE 4998. Co-ops/internships cannot be counted as professional electives in the Computer Engineering program.

Computers and Algorithms - choose one:

- CSI 3610 - Design and Analysis of Algorithm (4)
- CSI 3640 - Computer Organization (4)

Suggested electives:

- ECE 4772 - High Performance Embedded Programming (4)

1. Communication and networking

- ECE 3300 - Electromagnetics I (4)
- ECE 4210 - Communication Systems (4)
- ECE 4230 - Satellite-based Positioning System (4)

- ECE 4310 - Antennas (4)

2. Microelectronics

- ECE 3105 - Electronic Circuits and Devices II (4)
- ECE 4130 - Electronic Materials and Devices (4)
- ECE 4132 - VLSIC Design of Digital Chips (4)
- ECE 4135 - Integrated Electronics (4)

3. Mechatronics

- ECE 3600 - Electrical Machines (4)
- ECE 4400 - Automatic Control Systems (4)
- ECE 4415 - Microcomputer-based Control Systems (4)
- ECE 4520 - Automotive Mechatronics I (4)

4. Computer science

- CSI 3370 - Software Engineering and Practice (4)
- CSI 3450 - Database Design and Implementation (4)
- CSI 3610 - Design and Analysis of Algorithm (4)
- CSI 4240 - Cloud Computing (4)
- CSI 4480 - Information Security Practices (4)
- CSI 4500 - Fundamentals of Operating Systems (4)
- CSI 5490 - Wireless and Industrial Networks (4)

Major standing

To enroll in 3000- or higher-level courses and to become candidates for the degree of Bachelor of Science in Engineering with a major in Computer Engineering, students must gain major standing. An application for major standing should be submitted prior to intended enrollment in 3000- or higher-level courses. Students can obtain the major standing form from the SECS Undergraduate Advising website. At the time that major standing is approved, students with majors of Pre-Computer Engineering will have their major changed to Computer Engineering. Approval of both a major standing application and

change of major to Computer Engineering is required prior to enrolling in any 3000- or higher-level courses.

To gain major standing in Computer Engineering, students must:

A) have an average GPA of 2.0 in the following mathematics and science courses: MTH 1554, MTH 1555, APM 2555, CHM 1430, PHY 1610, and PHY 1620;

B) have an average GPA of 2.0 in the following engineering core courses: EGR 1200, EGR 1400, EGR 2400, EGR 2500, EGR 2600, EGR 2800;

C) have no more than two grades below C in the required courses listed in A and B above;

D) have not attempted any course listed in A and B above more than three times; and

E) have not repeated more than three different courses listed in A and B. Courses in which a W (withdrawal) grade is recorded will not be counted.

Conditional major standing may be granted in the semester in which the student will complete the courses listed in A and B above.

Performance requirements

Satisfactory completion of the program requires a GPA of at least 2.0 within each course group: mathematics and sciences, engineering core, and professional courses (including required professional subjects and professional electives) and a grade of C or better in the senior design capstone course (ECE 4999). Within professional courses, at most two grades below C are permitted, at most two different courses may be repeated, and a total of three repeat attempts per course are permitted.

Sample computer engineering schedule

Students entering the School of Engineering and Computer Science with the required background may follow a schedule such as the one indicated below. However, students will need additional time to complete the program if they do not have the required background upon entrance to the program.

Freshman year

Fall semester -- 17 credits

- CHM 1430 - Chemical Principles (4)
- EGR 1200 - Engineering Graphics and CAD (1)
- EGR 1400 - Computer Problem Solving in Engineering and Computer Science (4)
- MTH 1554 - Calculus I (4)

- WRT or General Education (4)

Winter semester -- 16 credits

- EGR 2400 - Introduction to Electrical and Computer Engineering (4)
- MTH 1555 - Calculus II (4)
- PHY 1610 - Fundamentals of Physics I (4)
- General Education (4)

Sophomore year

Fall semester -- 16 credits

- APM 2555 - Introduction to Differential Equations with Matrix Algebra (4)
- CSI 2290 - Introduction to Data Structures in C (4)
- EGR 2500 - Introduction to Thermal Engineering (4)
- PHY 1620 - Fundamentals of Physics II (4)

Winter semester -- 16 credits

- ECE 2700 - Digital Logic Design (4)
- EGR 2600 - Introduction to Industrial and Systems Engineering (4)
- EGR 2800 - Design and Analysis of Electromechanical Systems (4)
- General Education (4)

Junior year

Fall semester -- 16 credits

- ECE 2005 - Electric Circuits (4)
- ECE 3720 - Microprocessors (4)
- ECE 4710 - Computer Hardware Design (4)
- General Education (4)

Winter semester -- 16 credits

- APM 2663 - Discrete Mathematics (4)
- ECE 3100 - Electronic Circuits and Devices I (4)
- ECE 4721 - Embedded Systems Design (4)
- General Education (4)

Senior year

Fall semester -- 16 credits

- CSI 3610 - Design and Analysis of Algorithm (4) or CSI 3640 - Computer Organization (4)
- ECE 3204 - Signals and Systems (4)
- Professional elective (4)
- General Education (4)

Winter semester -- 16 credits

- ECE 4999 - Senior Design (4)
- Professional elective (4)
- General Education (4)
- Mathematics and Sciences elective (4)

Electrical Engineering, B.S.E.

Requirements for the major in electrical engineering, B.S.E. program

Electrical engineering is a broad field encompassing a number of disciplines. Oakland University's undergraduate program in electrical engineering is designed to provide students with the basic knowledge and skills for challenging careers in electrical engineering in the coming decades. The curriculum offers strong fundamentals in analog and digital circuits, communications, computers, controls, electromagnetics, electronics including VLSI systems, electronic devices, and power systems. In addition, a strong laboratory component of the program offers numerous design opportunities and allows students to relate theoretical ideas to practical problems using modern equipment and hardware/software tools. The program also provides numerous engineering design experiences. Electrical and computer engineering faculty members are engaged in research related to new developments in the field. Their activities contribute to a well-developed, up-to-date curriculum. The

BSE in Electrical Engineering program is accredited by the Engineering Accreditation Commission of ABET.

Program educational objectives

The undergraduate program in Electrical Engineering will provide educational experiences aimed toward producing graduates who will:

- Become successful practitioners in an engineering or related career.

- Pursue graduate study and/or continuing education opportunities in electrical engineering, computer engineering, or other related disciplines.

- Demonstrate leadership and excel in multidisciplinary and multicultural environments.

- Function as responsible members of society with an awareness of the ethical and social ramifications of their work.

Course requirements (minimum of 129 total credits)

To earn the degree of Bachelor of Science in Engineering with a major in electrical engineering, students must complete a minimum of 129 credits, demonstrate writing proficiency (see Undergraduate degree requirements) and meet the following requirements:

General education

The General Education Requirements are comprised of three parts: Foundations, Explorations, and Integration. In addition, U.S. Diversity requirements must also be met. For details, refer to the General Education section of the catalog. In order to satisfy both general education and other program requirements, in some of the general education areas students should select from the courses listed below:

Foundations:

- Writing Foundations - WRT 1060

- Formal Reasoning (Satisfied by MTH 1554 for engineering majors; see Mathematics and sciences)

Explorations: One course from each of the seven Explorations areas:

- Arts

- Language and Culture

- Global Perspective

- Literature
- Natural Science and Technology (satisfied by EGR 2400 or EGR 2500; see engineering core)
- Social Science (satisfied by ECN 1500, ECN 2010, or ECN 2020; see Additional Major Requirements)
- Western Civilization (satisfied by PHL 1310; see Additional Major Requirements)

Integration:

- Knowledge Applications (satisfied by MTH 1555 for engineering majors; see Mathematics and sciences)
- Capstone (satisfied by ECE 4999; see Required Professional Subjects)

U.S. Diversity:

- May be met by an approved course in the Explorations area

Writing Intensive:

- Writing Intensive in the Major (satisfied by ECE 4999; see Required Professional Subjects)
- Writing Intensive in General Education (may be met by an approved course in the Explorations area)

Additional Major Requirements:

All students must meet the following requirements. Courses from these selections can meet general education exploration areas above,

- Professional Ethics: PHL 1310 - Introduction to Ethics in Science and Engineering
- Economics: Choose one from ECN 1500, ECN 2010, or ECN 2020

In order to graduate on-schedule without taking additional courses, it is highly recommended that students meet with an SECS Undergraduate Academic Adviser concerning the selection of all of their general education courses.

Mathematics and sciences

- MTH 1554 - Calculus I (4)
- MTH 1555 - Calculus II (4)
- APM 2555 - Introduction to Differential Equations with Matrix Algebra (4)

- MTH 2554 - Multivariable Calculus (4)
- CHM 1430 - Chemical Principles (4)
- PHY 1610 - Fundamentals of Physics I (4)
- PHY 1620 - Fundamentals of Physics II (4)
- Approved Math/Science Elective from list below (4)

Approved Math/Science Elective Options:

Students majoring in Electrical Engineering are advised to take MTH 2775 to broaden their knowledge of Linear Algebra. However, students who have an explicit interest in broadening their knowledge in another area of math or science should select an elective from the following approved course list:

- APM 2663 - Discrete Mathematics (4)
- APM 3332 - Applied Matrix Theory (4)
- APM 3557 - Elements Partial Differential Equations (4)
- APM 4333 - Numerical Methods (4)
- APM 4334 - Applied Numerical Methods: Matrix Methods (4)
- APM 4555 - Intermediate Ordinary Differential Equations (4)
- APM 4663 - Graph Theory and Combinatorial Mathematics (4)
- APM 4777 - Computer Algebra (4)
- BIO 1200 - Biology I (4)
- BIO 3400 - Genetics (4)
- BIO 3220 - Neurobiology (4)
- BIO 4412 - Functional Genomics and Bioinformatics (4)
- CHM 1450 - General Chemistry II (4) and CHM 1480 - General Chemistry Laboratory II (1)
- MTH 3552 - Complex Variables (4)
- PHY 3250 - Biological Physics (4)
- PHY 3260 - Medical Physics (4)

- PHY 3310 - Optics (4)
- PHY 3610 - Mechanics I (4)
- PHY 3660 - Vibrations and Waves (4)
- PHY 3710 - Foundations of Modern Physics (4)
- PHY 4310 - Lasers and Applications (4)
- or others by approval by petition to the SECS Committee on Academic Standing.

Students must complete at least 30 credits in the required math/science area. Students with fewer than 30 credit hours of math/science, for example due to transfers from another institution, must take additional courses to satisfy this requirement. Additional courses in math/science must be from the approved Math/Science Elective Options listed above.

Engineering core

- EGR 1200 - Engineering Graphics and CAD (1)
- EGR 1400 - Computer Problem Solving in Engineering and Computer Science (4)
- EGR 2400 - Introduction to Electrical and Computer Engineering (4)
- EGR 2500 - Introduction to Thermal Engineering (4)
- EGR 2600 - Introduction to Industrial and Systems Engineering (4)
- EGR 2800 - Design and Analysis of Electromechanical Systems (4)

Required professional subjects

- ECE 2005 - Electric Circuits (4)
- ECE 2700 - Digital Logic Design (4)
- ECE 3100 - Electronic Circuits and Devices I (4)
- ECE 3105 - Electronic Circuits and Devices II (4)
- ECE 3204 - Signals and Systems (4)
- ECE 3300 - Electromagnetics I (4)
- ECE 3600 - Electrical Machines (4)

- ECE 4999 - Senior Design (4)

Professional electives

From the depth areas below students must complete two Key courses, one elective under one of the key courses, and one additional elective chosen from any 4000 level ECE course. Students with an overall GPA of 3.0 or greater may select one elective from ECE 5000 or SYS 5000 level courses. Prior approval of the chairperson of the Department of Electrical and Computer Engineering is required for ECE 4996 and ECE 4998. The professional depth areas are:

1. Communications

Key course:

- ECE 4210 - Communication Systems (4)

Electives:

- ECE 4220 - Fundamentals of Digital Signal Processing (4)
- ECE 4230 - Satellite-based Positioning System (4)

2. Computer Engineering

Key course:

- ECE 3720 - Microprocessors (4)

Electives:

- ECE 4710 - Computer Hardware Design (4)
- ECE 4721 - Embedded Systems Design (4)
- ECE 4772 - High Performance Embedded Programming (4)

3. Control systems

Key course:

- ECE 4400 - Automatic Control Systems (4)

Electives:

- ECE 4410 - Digital Control Systems (4)

- ECE 4415 - Microcomputer-based Control Systems (4)

4. Electromagnetics

Key course:

- ECE 4305 - Electromagnetics II (4)

Electives:

- ECE 4310 - Antennas (4)
- ECE 4320 - Electromagnetic Compatibility (4)

5. Electronics

Key course:

- ECE 4132 - VLSIC Design of Digital Chips (4)

Electives:

- ECE 4130 - Electronic Materials and Devices (4)
- ECE 4135 - Integrated Electronics (4)

6. Robotics

Key course:

- ECE 4500 - Robotic Systems and Control (4)

Electives:

- ECE 4510 - Machine Vision (4)
- ECE 4520 - Automotive Mechatronics I (4)
- ECE 4551 - Human Robot Interaction (4)

7. Power systems

Key course:

- ECE 4610 - Introduction to Power Electronics (4)

Electives:

- ECE 4620 - Electrical Energy Systems (4)
- ECE 4630 - Electric and Hybrid Drive Systems (4)

Major standing

To enroll in 3000- or higher-level courses and to become candidates for the degree of Bachelor of Science with a major in Electrical Engineering, students must gain major standing. An application for major standing should be submitted prior to intended enrollment in 3000- or higher-level courses. Forms may be obtained from the SECS Undergraduate Advising Office or from the SECS website. At the time that major standing is approved, students with majors of Pre-Electrical Engineering will have their major changed to Electrical Engineering. Approval of both a major standing application and change of major to Electrical Engineering is required prior to enrolling in any 3000- or higher-level courses.

To gain major standing in Electrical Engineering, students must:

A) have an average GPA of 2.0 in the following mathematics and science courses: MTH 1554, MTH 1555, APM 2555, CHM 1430, PHY 1610 and PHY 1620;

B) have an average GPA of 2.0 in the following engineering core courses: EGR 1200, EGR 1400, EGR 2400, EGR 2500, EGR 2600, EGR 2800;

C) have no more than two grades below C in the required courses listed in A and B above;

D) have not attempted any course listed in A and B above more than three times; and

E) have not repeated more than three different courses listed in A and B. Courses in which a W (withdrawal) grade is recorded will not be counted.

Conditional major standing may be granted in the semester in which the student will complete the courses listed in A and B above.

Performance requirements

Satisfactory completion of the program requires a GPA of at least 2.0 within each course group: mathematics and sciences, engineering core, and professional courses (including required professional subjects and professional electives) and a grade of C or better in the senior design capstone course (ECE 4999). Within professional courses, at most two grades below C are permitted, at most two different courses may be repeated, and a total of three attempts per course are permitted.

Sample electrical engineering program schedule

Students entering the School of Engineering and Computer Science with the required background may follow a schedule such as the one indicated below. However, students will need additional time to complete the program if they do not have the required background upon entrance to the program.

Freshman year

Fall semester -- 17 credits

- CHM 1430 - Chemical Principles (4)
- EGR 1200 - Engineering Graphics and CAD (1)
- EGR 1400 - Computer Problem Solving in Engineering and Computer Science (4)
- MTH 1554 - Calculus I (4)
- WRT or General Education (4)

Winter semester -- 16 credits

- EGR 2400 - Introduction to Electrical and Computer Engineering (4)
- MTH 1555 - Calculus II (4)
- PHY 1610 - Fundamentals of Physics I (4)
- General Education (4)

Sophomore year

Fall semester -- 16 credits

- APM 2555 - Introduction to Differential Equations with Matrix Algebra (4)
- ECE 2005 - Electric Circuits (4)
- PHY 1620 - Fundamentals of Physics II (4)
- General Education (4)

Winter semester -- 16 credits

- EGR 2500 - Introduction to Thermal Engineering (4)
- EGR 2600 - Introduction to Industrial and Systems Engineering (4)
- EGR 2800 - Design and Analysis of Electromechanical Systems (4)
- General Education (4)

Junior year

Fall semester -- 16 credits

- ECE 3100 - Electronic Circuits and Devices I (4)
- ECE 3204 - Signals and Systems (4)
- MTH 2554 - Multivariable Calculus (4)
- General Education (4)

Winter semester -- 16 credits

- ECE 2700 - Digital Logic Design (4)
- ECE 3105 - Electronic Circuits and Devices II (4)
- ECE 3300 - Electromagnetics I (4)
- ECE 3600 - Electrical Machines (4)

Senior year

Fall semester -- 16 credits

- Key course-area 1 (4)
- Key course-area 2 (4)
- Mathematics and Sciences elective (4)
- General Education (4)

Winter semester -- 16 credits

- Elective-area 1 (4)
- ECE Elective (4)
- ECE 4999 - Senior Design (4)
- General education (4)

Industrial and Systems Engineering, B.S.E.

Requirements for the major in industrial and systems engineering, B.S.E. program

The profession of Industrial and Systems Engineering is about choices. Other engineering disciplines apply skills to very specific areas. Industrial and Systems Engineering gives you the opportunity to work in a variety of businesses. Whether it's distributing products worldwide, manufacturing superior automobiles, or streamlining the procedures in an operating room, all of these situations share the common goal of increasing efficiencies and saving companies money. The most distinctive aspect of Industrial and Systems Engineering is the career and job flexibility it offers. Industrial and Systems Engineers work in various industries including automotive, energy, healthcare, advanced and digital manufacturing, defense, logistics, service, aerospace, entertainment and others.

Program educational objectives

The educational objectives of the Industrial and Systems Engineering B.S.E. program are to produce graduates who will:

- design, develop, implement, sustain and improve systems which integrate people, materials, equipment, information and energy;

- operate effectively in dynamic and diverse organizations;

- demonstrate a professional attitude, integrity and commitment to life-long learning in their work.

Course requirements (128 total credits)

In order to earn the degree of Bachelor of Science in Engineering with a major in industrial and systems engineering, students must complete a minimum of 128 credits, satisfy all general education and SECS degree requirements, as well as meet the following course requirements:

General education

The General Education Requirements are comprised of three parts: Foundations, Explorations, and Integration. In addition, U.S. Diversity requirements must also be met. For details, refer to the General Education section of the catalog. In order to satisfy both general education and other program requirements, in some of the general education areas students should select from the courses listed below:

Foundations:

- Writing Foundations - WRT 1060

- Formal Reasoning - (Satisfied by MTH 1554; see Mathematics and Sciences)

Explorations: One course from each of the seven Explorations areas

- Arts

- Language and Culture

- Global Perspective
- Literature
- Natural Science and Technology - (Satisfied by EGR 2400 or EGR 2500; see Engineering Core)
- Social Science - (Satisfied by ECN 1500, ECN 2010, or ECN 2020; see Major corequisites. Additional Major Requirements)
- Western Civilization - (Satisfied by PHL 1310 - Introduction to Ethics in Science and Engineering; see Additional Major Requirements. However, if an ISE major takes ISE 4421 - Leadership Principles and Positive Engagement, then they may take any Western Civilization course); see Major corequisites.

Integration:

- Knowledge Applications -Satisfied by MTH 1555; see Mathematics and sciences
- Capstone (Satisfied by ISE 4991; see Required professional courses)

U.S. Diversity:

- May be met by an approved course in the Explorations area.

Writing Intensive and Capstone:

- Capstone (Satisfied by ISE 4991; see Required professional courses)
- Writing Intensive in the Major (Satisfied by ISE 4991; see Required professional subjects)
- Writing Intensive in General Education (may be met by an approved course in the Explorations area)

* In order to graduate on-schedule without taking additional courses, it is highly recommended that students meet with a SECS Undergraduate Academic Adviser concerning the selection of all of their general education courses.

Additional Major Requirements

All students must meet the following requirements. Some courses from these selections also satisfy general education exploration areas above.

- Professional Ethics: Choose one from PHL 1310 - Introduction to Ethics in Science and Engineering or ISE 4421 - Leadership Principles and Positive Engagement
- Economics: Choose one from ECN 1500, ECN 2010 or ECN 2020

Mathematics and Sciences

- MTH 1554 - Calculus I (4)
- MTH 1555 - Calculus II (4)
- APM 2555 - Introduction to Differential Equations with Matrix Algebra (4) (or [APM 2559 (4) and MTH 2775 (4)])
- APM 2663 - Discrete Mathematics (4) or MTH 2554 - Multivariable Calculus (4)
- CHM 1430 - Chemical Principles (4)
- PHY 1610 - Fundamentals of Physics I (4)
- PHY 1620 - Fundamentals of Physics II (4)
- Approved Math/Science Elective from list below (4)

Approved Math/Science Elective Options

Students who complete APM 2559 and MTH 2775 instead of APM 2555 above are not permitted to use MTH 2775 toward the elective requirement. It is recommended that students discuss their educational and career interests with an ISE Dept. faculty member or a SECS Undergraduate Academic Adviser prior to selecting this course:

- APM 2663 - Discrete Mathematics (4)
- APM 3332 - Applied Matrix Theory (4)
- APM 3557 - Elements Partial Differential Equations (4)
- APM 4333 - Numerical Methods (4)
- APM 4334 - Applied Numerical Methods: Matrix Methods (4)
- APM 4663 - Graph Theory and Combinatorial Mathematics (4)
- APM 4777 - Computer Algebra (4)
- BIO 1200 - Biology I (4)
- BIO 1300 - Biology II (4)
- BIO 2100 - Human Anatomy (4)
- BIO 2600 - Human Physiology (4)
- BIO 3400 - Genetics (4)

- MTH 2554 - Multivariable Calculus (4)
- MTH 2775 - Linear Algebra (4)
- MTH 3552 - Complex Variables (4)
- PHY 3250 - Biological Physics (4)
- PHY 3260 - Medical Physics (4)
- STA 4002 - Applied Linear Models I (4)
- Other math or science course with approval by written petition to the SECS Committee on Academic Standing. Please contact a SECS Undergraduate Academic Adviser for more information.

Students must complete at least 30 credits in the required math/science area. Students with fewer than 30 credit hours of math/science, for example due to transfers from another institution, must take additional courses to satisfy this requirement. Additional courses in math/science must be from the approved departmental list or by petition of exception.

Engineering core subjects

- EGR 1200 - Engineering Graphics and CAD (1)
- EGR 1400 - Computer Problem Solving in Engineering and Computer Science (4)
- EGR 2400 - Introduction to Electrical and Computer Engineering (4)
- EGR 2500 - Introduction to Thermal Engineering (4)
- EGR 2600 - Introduction to Industrial and Systems Engineering (4)
- EGR 2800 - Design and Analysis of Electromechanical Systems (4)

Required professional subjects

- ISE 3318 - Engineering Statistics and Economic Analysis (4)
- ISE 3330 - Engineering Operations Research (3)
- ISE 3341 - Ergonomics and Work Design (4)
- ISE 4469 - Computer Simulation of Discrete Event Systems (4)
- ISE 4483 - Production Systems and Workflow Analysis (4)
- ISE 4484 - Flexible and Lean Manufacturing Systems (4)

- ISE 4485 - Statistical Quality Analysis (4)
- ISE 4487 - Foundations of Systems Engineering (4)
- ISE 4491 - Senior Design (4)

Professional electives

Students must complete 12 credits of professional electives. At least 8 of the 12 credits must be from Group A. The remaining 4 credits can be from Group A or Group B.

Group A

- ISE 4410 - Supply Chain Modeling and Analysis (4)
- ISE 4421 - Leadership Principles and Positive Engagement (4)
- ISE 4422 - Robotic Systems (4)
- ISE 4423 - Industrial Automation Systems (4)
- ISE 4431 - Engineering Operations Research - Stochastic Models (4)
- ISE 4434 - Metamodeling and Optimization Methods in Design (4)
- ISE 4435 - Data Analytics (4)
- ISE 4441 - Human Factors Engineering (4)
- ISE 4450 - Fundamentals of Energy Management (4)
- ISE 4455 - Foundations of Safety Engineering (4)
- ISE 4456 - Engineering Risk Analysis (4)
- ISE 4461 - PLM Applications - Product Data Management (2)
- ISE 4462 - PLM Applications- Robotic Systems (2)
- ISE 4463 - PLM Applications - Ergonomics (2)
- ISE 4464 - Design for Manufacturing and Assembly Analysis (4)
- ISE 4466 - PLM Applications - Change Management (2)
- ISE 4467 - PLM Applications - Throughput Simulation (2)

- ISE 4480 - E-Commerce and ERP (4)
- ISE 4482 - Engineering Processes Decisions Using ERP (4)
- ISE 4488 - Advanced Systems Engineering (4)
- ISE 4900 - Special Topics (2 TO 4)
- ME 4700 - Manufacturing Processes (4)
- Any new ISE 4000-level courses listed in subsequent catalogs (2 TO 4)

Group B

- ISE 4996 - Independent Study (2 TO 4) *
- ISE 4998 - Senior Project (2 TO 4) *
- ME 3700 - Properties of Materials (4)
- HRD 4600 - Lean Kaizen in Organizations (4)

* This course cannot be taken without prior written permission from the Chairperson of the Industrial and Systems Engineering Department.

Major Standing

To enroll in 3000- or higher level courses and to become candidates for the degree of Bachelor of Science in Engineering with a major in Industrial and Systems Engineering, students must gain major standing. An application for major standing should be submitted prior to intended enrollment in 3000- or higher level courses. Forms may be obtained from the SECS Undergraduate advising office or from the SECS website. At the time that major standing is approved, students with majors of Pre-Industrial and Systems Engineering will have their major changed to Industrial and Systems Engineering. Approval of both a major standing application and change of major to Industrial and Systems Engineering is required prior to enrolling in any 3000- or higher-level courses.

To gain major standing in Industrial and Systems Engineering, students must:

A. have an average GPA of at least 2.0 in the following mathematics and sciences courses: MTH 1554, MTH 1555, APM 2555, CHM 1430 , PHY 1610, PHY 1620.

B. have an average GPA of at least 2.0 in the following engineering core courses: EGR 1200, EGR 1400, EGR 2400, EGR 2500, EGR 2600, EGR 2800.

C. have no more than two grades below C in the courses listed in A and B above;

D. have not attempted any course listed in A and B above more than three times.

E. have not repeated more than three different courses listed in A and B above. Courses in which a W (withdrawal) grade is recorded will not be counted.

Conditional major standing may be granted for the semester in which the student will complete the courses listed in A and B above.

Performance requirements

Satisfactory completion of the program requires a grade-point average of at least a 2.0 within each of the following groups of courses: mathematics and sciences courses; engineering core courses; and professional courses (all required professional subjects and professional electives) and a grade of C or better in the senior design capstone course (ISE 4991).

Within the professional courses, at most two grades below C are permitted, at most two different courses may be repeated, and a total of three attempts per course is permitted.

General business minor

Students may wish to augment their degree with a minor in general business. This may be done by completing 19-23 credits specified by the School of Business Administration (see Minors section in School of Business Administration portion of this catalog). Credits from the minor may be used to satisfy the social science general education requirement and the economics requirement.

Sample industrial and systems engineering schedule

Industrial and systems engineering students with the required background may follow a schedule such as the one below. However, students will need additional time to complete the program if they do not have the required background upon entrance to the program. All students should contact the SECS Undergraduate Advising Office before completing their schedule.

Freshman year

Fall semester -- 16 credits

- EGR 1400 - Computer Problem Solving in Engineering and Computer Science (4)
- MTH 1554 - Calculus I (4)
- CHM 1430 - Chemical Principles (4)
- General education course (4)

Winter semester -- 17 credits

- EGR 1200 - Engineering Graphics and CAD (1)
- EGR 2400 - Introduction to Electrical and Computer Engineering (4)

- MTH 1555 - Calculus II (4)
- PHY 1610 - Fundamentals of Physics I (4)
- General education course (4)

Sophomore year

Fall semester -- 16 credits

- EGR 2600 - Introduction to Industrial and Systems Engineering (4)
- APM 2555 - Introduction to Differential Equations with Matrix Algebra (4)
- PHY 1620 - Fundamentals of Physics II (4)
- General education course (4)

Winter semester -- 16 credits

- EGR 2500 - Introduction to Thermal Engineering (4)
- EGR 2800 - Design and Analysis of Electromechanical Systems (4)
- APM 2663 - Discrete Mathematics (4) or MTH 2554 - Multivariable Calculus (4)
- General education course (4)

Junior year

Fall semester -- 16 credits

- ISE 3318 - Engineering Statistics and Economic Analysis (4)
- ISE 3341 - Ergonomics and Work Design (4)
- General education course (4)
- Math or science elective course (4)

Winter semester -- 15 credits

- ISE 3330 - Engineering Operations Research (3)
- ISE 4469 - Computer Simulation of Discrete Event Systems (4)
- ISE 4484 - Flexible and Lean Manufacturing Systems (4)

- General education course (4)

Senior year

Fall semester -- 16 credits

- ISE 4483 - Production Systems and Workflow Analysis (4)
- Professional elective course(s) (one 4 credits or two 2 credits)
- Professional elective course(s) (one 4 credits or two 2 credits)
- General education course (4)

Winter semester -- 16 credits

- ISE 4485 - Statistical Quality Analysis (4)
- ISE 4487 - Foundations of Systems Engineering (4)
- ISE 4491 - Senior Design (4)
- Professional elective course(s) (one 4 credits or two 2 credits)

Mechanical Engineering, B.S.E.

Requirements for the major in mechanical engineering, B.S.E.

The field of mechanical engineering offers career opportunities in areas such as design, analysis, test development, research and the manufacturing of various products. Oakland University's mechanical engineering program provides students with a foundation in the fundamental concepts and principles associated with mechanics of solids, thermodynamics, fluid and thermal energy, materials, manufacturing, design of mechanical systems, electrical circuits, computer programming and software utilization. A strong laboratory experience and the utilization of instrumentation and computer simulation tools are interwoven through the curriculum. The program also provides numerous engineering design experiences. The BSE in Mechanical Engineering program is accredited by the Engineering Accreditation Commission of ABET.

Program educational objectives

The objectives of the Mechanical Engineering program are to produce graduates, who three to five years after graduation, will:

- function successfully in engineering roles within the automotive and other global industries,
- engage in lifelong learning and pursue graduate study in mechanical engineering or other post-graduate education,
- contribute effectively and ethically to a modern, multidisciplinary workplace, and
- demonstrate effective communication, problem-solving and teamwork skills.

Course requirements(minimum of 128 total credits)

In order to earn the degree of Bachelor of Science in Engineering with a major in mechanical engineering, students must complete a minimum of 128 credits and meet the following requirements:

General education

The General Education Requirements are comprised of three parts: Foundations, Explorations, and Integration. In addition, U.S. Diversity requirements must also be met. For details, refer to the General Education section of the catalog. In order to satisfy both general education and other program requirements, in some of the general education areas students should select from the courses listed below:

Foundations:

- Writing Foundations - WRT 1060
- Formal Reasoning (satisfied by MTH 1554; see Mathematics and Sciences)

Explorations: One course from each of the seven Explorations areas:

- Arts
- Language and Culture
- Global Perspective
- Literature
- Natural Science and Technology (satisfied by EGR 2400 or EGR 2500; see Engineering Core)
- Social Science (satisfied by ECN 1500, ECN 2010 or ECN 2020; see Additional Major Requirements)
- Western Civilization (satisfied by PHL 1310; see Additional Major Requirements)

Integration:

- Knowledge Applications (satisfied by MTH 1555; see Mathematics and Sciences)
- Capstone (satisfied by ME 4999; see Required Professional Subjects)

U.S. Diversity:

- May be met by an approved course in the Explorations area

Writing Intensive:

- Writing Intensive in the Major (satisfied by ME 4999; see Required Professional Subjects)
- Writing Intensive in General Education (may be met by an approved course in the Explorations area)

Additional Major Requirements:

All mechanical engineering students must meet the following requirements. Courses from these selections can meet general education exploration areas above.

- Professional Ethics: PHL 1310 - Introduction to Ethics in Science and Engineering
- Economics: Choose one from ECN 1500, ECN 2010 or ECN 2020

In order to graduate on-schedule without taking additional courses, it is highly recommended that students meet with an SECS Undergraduate Academic Adviser concerning the selection of all of their general education courses.

Mathematics and Sciences

Students must complete at least 30 credits in the required math/science area. Students with fewer than 30 credit hours of math/science, for example due to transfers from another institution, must take additional courses to satisfy this requirement. Additional courses in math/science must be from the approved departmental list or by petition of exception.

- MTH 1554 - Calculus I (4)
- MTH 1555 - Calculus II (4)
- APM 2555 - Introduction to Differential Equations with Matrix Algebra (4)
- MTH 2554 - Multivariable Calculus (4)
- CHM 1430 - Chemical Principles (4) or CHM 1440 - General Chemistry I (1)
- PHY 1610 - Fundamentals of Physics I (4) or PHY 1510 - Introductory Physics I (4)

- PHY 1620 - Fundamentals of Physics II (4) or PHY 1520 - Introductory Physics II (4)
- Approved Math/Science Elective from list below (4)

Approved Math/Science Elective Options

Students majoring in mechanical engineering are advised to take MTH 2775 to broaden their knowledge of linear algebra. However, students who have an explicit interest in broadening their knowledge in a specific area of math or science should select an elective from the following approved course list:

- APM 3332 - Applied Matrix Theory (4)
- APM 3557 - Elements Partial Differential Equations (4)
- APM 4333 - Numerical Methods (4)
- APM 4334 - Applied Numerical Methods: Matrix Methods (4)
- BIO 1200 - Biology I (4)
- CHM 1450 - General Chemistry II (4) and CHM 1480 - General Chemistry Laboratory II (1)
- MTH 2775 - Linear Algebra (4)
- MTH 3552 - Complex Variables (4)
- PHY 3250 - Biological Physics (4)
- PHY 3310 - Optics (4)
- PHY 3660 - Vibrations and Waves (4)
- PHY 3710 - Foundations of Modern Physics (4)
- Other courses approved by petition to the SECS Committee on Academic Standing.

Engineering Core

- EGR 1200 - Engineering Graphics and CAD (1)
- EGR 1400 - Computer Problem Solving in Engineering and Computer Science (4)
- EGR 2400 - Introduction to Electrical and Computer Engineering (4)
- EGR 2500 - Introduction to Thermal Engineering (4)
- EGR 2600 - Introduction to Industrial and Systems Engineering (4)

- EGR 2800 - Design and Analysis of Electromechanical Systems (4)

Required Professional Subjects

- ME 3200 - Engineering Mechanics (4)
- ME 3250 - Mechanics of Materials (4)
- ME 3300 - Computer-Aided Design (3)
- ME 3500 - Introduction to Fluid and Thermal Energy Transport (4)
- ME 3700 - Properties of Materials (4)
- ME 4200 - Vibrations and Controls (4)
- ME 4300 - Mechanical Systems Design (4)
- ME 4500 - Energy Systems Analysis and Design (4)
- ME 4999 - Senior Mechanical Engineering Design Project (4) or ME 4998 - Senior Project (4)*

Note

*ME 4998 requires approval of project proposal by the Mechanical Engineering Department. If taken in place of ME 4999, it must be team-based.

Professional Electives

Mechanical engineering students must complete at least 12 additional credits of 4000- or 5000-level ME, BE, ISE, or ECE designated courses (must have instructor's permission to take 5000-level courses). At least 8 of these credits must have an ME designation. Students interested in broadening their knowledge in a specific area of mechanical engineering should elect sequences of courses as described in the specialized professional depth areas listed below:

1. Energy, Fluid and Thermal Systems depth area. Includes courses in the fluid and thermal energy transport area.

Recommended fundamental subjects

- ME 4510 - Intermediate Fluid Mechanics (4)
- ME 4520 - Intermediate Heat Transfer (4)

Other relevant courses

- ME 4530 - Alternative Energy Systems (4)

- ME 4535 - Introduction to Electric Drive Vehicle Engineering (4)
- ME 4540 - Internal Combustion Engines I (4)
- ME 4550 - Fluid and Thermal Systems Design (4)

2. Computer-Aided Design depth area. Includes courses in the computer-aided design (CAD) and analysis area.

Recommended fundamental subjects

- ME 4350 - Mechanical Computer-Aided Engineering (4)
- ME 4360 - Mechanical Computer-Aided Manufacturing (4)

3. Automotive Engineering depth area. Includes courses with an automotive engineering emphasis area with two possible areas of specialty: automotive structures or internal combustion engines.

Recommended fundamental subjects: Automotive Structures Specialty

- ME 4210 - Analysis and Design of Mechanical Structures (4)
- ME 4220 - Vehicle Dynamics (4)

Recommended fundamental subjects: Internal Combustion Engines Specialty

- ME 4540 - Internal Combustion Engines I (4)

Other relevant courses

- ME 4230 - Automotive Driveline Dynamics (4)
- ME 4260 - Acoustics and Noise Control (4)
- ME 4510 - Intermediate Fluid Mechanics (4)
- ME 4520 - Intermediate Heat Transfer (4)
- ME 4535 - Introduction to Electric Drive Vehicle Engineering (4)
- ME 4750 - Optical Measurement and Quality Inspection (4)
- ME 4350 - Mechanical Computer-Aided Engineering (4)
- ME 4730 - Fasteners and Bolted Joints (4)
- ECE 4400 - Automatic Control Systems (4)

- ECE 4110 - Automotive Electronics (4)
- ECE 4520 - Automotive Mechatronics I (4)

4. Manufacturing Engineering depth area. This depth area includes courses in the manufacturing area.

Recommended fundamental subjects

- ME 4600 - Materials Properties and Processes (4)
- ME 4700 - Manufacturing Processes (4)

Other relevant courses

- ME 4710 - Flexible and Lean Manufacturing Systems (4)
- ME 4750 - Optical Measurement and Quality Inspection (4)
- ME 4740 - Robotic Systems (4)
- ME 4360 - Mechanical Computer-Aided Manufacturing (4)
- ECE 4400 - Automatic Control Systems (4)
- ISE 4485 - Statistical Quality Analysis (4)

5. Materials Engineering depth area. This depth area includes courses in the areas of basic and advanced materials, plastics and composites manufacturing

Recommended fundamental subjects

- ME 4610 - Polymeric Materials (4)
- ME 4600 - Materials Properties and Processes (4)
- ME 5530 - Plastics Processing Engineering (4)

6. Nuclear Engineering depth area. This depth area includes courses in the nuclear engineering area.

Required fundamental subjects

- ME 4520 - Intermediate Heat Transfer (4)
- ME 4580 - Fundamentals of Nuclear Engineering (3)

- ME 4585 - Nuclear Reactors and Power Plants (3)

- PHY 3180 - Nuclear Physics Laboratory (2) (PHY 3180 (2) requires ME 4580 (3) as a pre or co-requisite)

Optional Specializations:

The Mechanical Engineering Department offers optional specializations in Automotive Engineering, Manufacturing, and Energy to students interested in broadening their knowledge in a specific area of mechanical engineering and wishing an area of specialization in their degree. Specializations are available to, but not required of, any student enrolled in the Bachelor of Science degree in Mechanical Engineering. The sequences of courses listed below for each specialization are taken to satisfy the professional electives requirement. Note that completing the Bachelor of Science degree in Mechanical Engineering with a specialization may require more than 128 credits. Students may earn only one specialization and the specialization must be completed as part of their degree. The specialization will be noted on the students' transcript and diploma.

1. Automotive Engineering Specialization

The Automotive Engineering Specialization includes courses related to powertrain, vehicle dynamics, as well as systems integration as they relate to vehicle design. To earn a Bachelor of Science degree in Mechanical Engineering with a specialization in Automotive Engineering, students must complete the following sequence of courses to satisfy their professional electives requirement. Please note that completing this specialization may require more than 128 credits.

Required fundamental subjects - 12 credits

- ME 4220 - Vehicle Dynamics (4)

- ME 4350 - Mechanical Computer-Aided Engineering (4)

- ME 4540 - Internal Combustion Engines I (4)

Select at least 4 credits from the following:

- ME 4230 - Automotive Driveline Dynamics (4)

- ME 4260 - Acoustics and Noise Control (4)

- ME 4510 - Intermediate Fluid Mechanics (4)

- ME 4535 - Introduction to Electric Drive Vehicle Engineering (4)

- ME 4630 - Lubrication, Friction, and Wear (4)

- ME 4803 - PREP III: Powertrain Readiness Engineering Program (2)

- ME 4804 - PREP IV: Powertrain Readiness Engineering Program (2)
- ME 4900 - Special Topics (2 TO 4) with prior approval
- ME 5900 - Special Topics (2 TO 4) with prior approval
- ME 5560 - Combustion processes (4)
- ECE 4110 - Automotive Electronics (4)
- ECE 4520 - Automotive Mechatronics I (4)

2. Manufacturing Specialization

The Manufacturing Specialization includes courses related to manufacturing processes for metals and plastics as well as manufacturing systems. To earn a Bachelor of Science degree in Mechanical Engineering with a specialization in Manufacturing, students must complete the following sequence of courses to satisfy their professional electives requirement. Please note that completing this specialization may require more than 128 credits.

Required fundamental subjects - 12 credits

- ME 4360 - Mechanical Computer-Aided Manufacturing (4)
- ME 4600 - Materials Properties and Processes (4)
- ME 4700 - Manufacturing Processes (4)

Select at least 4 credits from the following:

- ME 4710 - Flexible and Lean Manufacturing Systems (4)
- ME 4740 - Robotic Systems (4)
- ME 4750 - Optical Measurement and Quality Inspection (4)
- ME 4900 - Special Topics (2 TO 4) with prior approval
- ME 5900 - Special Topics (2 TO 4) with prior approval
- ME 5700 - Polymer Processing (4)
- ECE 4400 - Automatic Control Systems (4)
- ISE 4485 - Statistical Quality Analysis (4)

3. Energy Specialization

The Energy Specialization includes fundamental courses in energy systems as well as fundamental courses in the fluid and thermal sciences. To earn a Bachelor of Science degree in Mechanical Engineering with a specialization in Energy, students must complete the following sequence of courses to satisfy their professional electives requirement. Please note that completing this specialization may require more than 128 credits.

Required fundamental subjects - 8 credits

- ME 4510 - Intermediate Fluid Mechanics (4) or ME 4520 - Intermediate Heat Transfer (4)
- ME 4530 - Alternative Energy Systems (4)

Select at least 8 credits from the following:

- ME 4510 - Intermediate Fluid Mechanics (4) if not taken as a required fundamental subject
- ME 4520 - Intermediate Heat Transfer (4) if not taken as a required fundamental subject
- ME 4535 - Introduction to Electric Drive Vehicle Engineering (4)
- ME 4540 - Internal Combustion Engines I (4)
- ME 4550 - Fluid and Thermal Systems Design (4)
- ME 4580 - Fundamentals of Nuclear Engineering (3)
- ME 4585 - Nuclear Reactors and Power Plants (3)
- ME 4900 - Special Topics (2 TO 4) with prior approval
- ME 4996 - Independent Study (1 TO 4) with prior approval
- ME 5900 - Special Topics (2 TO 4) with prior approval
- ME 5560 - Combustion Processes (4)
- PHY 3180 - Nuclear Physics Laboratory (2) (requires ME 4580 (3) as a pre- or co-requisite)

Major Standing

To enroll in 3000- or higher level courses and to become candidates for the degree of Bachelor of Science in Engineering with a major in Mechanical Engineering, students must gain major standing. An application for major standing should be submitted prior to intended enrollment in 3000- or higher level courses. Students can obtain the major standing form from the SECS Undergraduate Advising Website. At the time that major standing is approved, students with majors of Pre-Mechanical Engineering will have their major changed to Mechanical Engineering. Approval of both a major standing application and

change of major to Mechanical Engineering is required prior to enrolling in any 3000- or higher-level courses.

To gain major standing in Mechanical Engineering, students must:

A) have an average GPA of 2.0 in the following mathematics and science courses: MTH 1554, MTH 1555, APM 2555, CHM 1430 (or CHM 1440), PHY 1610 (or PHY 1510), PHY 1620 (or PHY 1520);

B) have an average GPA of 2.0 in the following engineering core courses: EGR 1200, EGR 1400, EGR 2400, EGR 2500, EGR 2600, EGR 2800. Note that some mechanical engineering courses require a minimum grade of C in EGR 2500 or EGR 2800;

C) have no more than two grades below C in the required courses in A and B above;

D) have not attempted any course listed in A and B above more than three times; and

E) have not repeated more than three different courses listed in A and B. Courses in which a W (withdrawal) grade is recorded will not be counted.

Conditional major standing may be granted in the semester in which the student will complete the courses listed in A and B above.

Performance requirements

Satisfactory completion of the program requires a GPA of at least 2.0 within each course group: mathematics and sciences, engineering core, and professional courses (including required professional subjects and professional electives) and a grade of C or better in the senior design capstone course (ME 4999 or ME 4998). Within professional courses, at most two grades below C are permitted, at most two different courses may be repeated, and a total of three repeat attempts per course are permitted.

Sample mechanical engineering schedule

Students entering the School of Engineering and Computer Science with the required background may follow a schedule such as the one indicated below. However, students will need additional time to complete the program if they do not have the required background upon entrance to the program.

Freshman year

Fall semester -- 17 total credits

- CHM 1430 - Chemical Principles (4)
- EGR 1200 - Engineering Graphics and CAD (1)
- EGR 1400 - Computer Problem Solving in Engineering and Computer Science (4)
- MTH 1554 - Calculus I (4)

- General Education (4)

Winter semester -- 16 total credits

- EGR 2400 - Introduction to Electrical and Computer Engineering (4)
- MTH 1555 - Calculus II (4)
- PHY 1610 - Fundamentals of Physics I (4)
- General Education (4)

Sophomore year

Fall semester -- 16 total credits

- APM 2555 - Introduction to Differential Equations with Matrix Algebra (4)
- EGR 2500 - Introduction to Thermal Engineering (4)
- PHY 1620 - Fundamentals of Physics II (4)
- General Education (4)

Winter semester -- 16 total credits

- EGR 2600 - Introduction to Industrial and Systems Engineering (4)
- EGR 2800 - Design and Analysis of Electromechanical Systems (4)
- MTH 2554 - Multivariable Calculus (4)
- General Education (4)

Junior year

Fall semester -- 16 total credits

- ME 3200 - Engineering Mechanics (4)
- ME 3500 - Introduction to Fluid and Thermal Energy Transport (4)
- ME 3700 - Properties of Materials (4)
- General Education (4)

Winter semester -- 15 total credits

- ME 3250 - Mechanics of Materials (4)
- ME 3300 - Computer-Aided Design (3)
- Professional Elective (4)
- Approved Math/Science elective (4)

Senior year

Fall semester -- 16 total credits

- ME 4200 - Vibrations and Controls (4)
- ME 4500 - Energy Systems Analysis and Design (4)
- Professional Elective (4)
- General Education (4)

Winter semester -- 16 total credits

- ME 4300 - Mechanical Systems Design (4)
- ME 4999 - Senior Mechanical Engineering Design Project (4)
- Professional Elective (4)
- General Education (4)

Mechanical Engineering, B.S.E., Specialization in Automotive Engineering

The Mechanical Engineering Department offers optional specializations in Automotive Engineering, Manufacturing, and Energy to students interested in broadening their knowledge in a specific area of mechanical engineering and wishing an area of specialization in their degree. Specializations are available to, but not required of, any student enrolled in the Bachelor of Science degree in Mechanical Engineering. The sequences of courses listed below for each specialization are taken to satisfy the professional electives requirement. Note that completing the Bachelor of Science degree in Mechanical Engineering with a specialization may require more than 128 credits. Students may earn only one specialization and the specialization must be completed as part of their degree. The specialization will be noted on the students' transcript and diploma.

See Mechanical Engineering, B.S.E. and advisor for complete details on specialization.

Automotive Engineering Specialization

The Automotive Engineering Specialization includes courses related to powertrain, vehicle dynamics, as well as systems integration as they relate to vehicle design. To earn a Bachelor of Science degree in Mechanical Engineering with a specialization in Automotive Engineering, students must complete the following sequence of courses to satisfy their professional electives requirement. Please note that completing this specialization may require more than 128 credits.

Required fundamental subjects - 12 credits

- ME 4220 - Vehicle Dynamics (4)
- ME 4350 - Mechanical Computer-Aided Engineering (4)
- ME 4540 - Internal Combustion Engines I (4)

Select at least 4 credits from the following

- ME 4230 - Automotive Driveline Dynamics (4)
- ME 4260 - Acoustics and Noise Control (4)
- ME 4510 - Intermediate Fluid Mechanics (4)
- ME 4535 - Introduction to Electric Drive Vehicle Engineering (4)
- ME 4630 - Lubrication, Friction, and Wear (4)
- ME 4803 - PREP III: Powertrain Readiness Engineering Program (2)
- ME 4804 - PREP IV: Powertrain Readiness Engineering Program (2)
- ME 4900 - Special Topics (2 TO 4) with prior approval
- ME 5900 - Special Topics (2 TO 4) with prior approval
- ME 5560 - Combustion Processes (4) with prior approval
- ECE 4110 - Automotive Electronics (4)
- ECE 4520 - Automotive Mechatronics I (4)

Major Standing

To enroll in 3000- or higher level courses and to become candidates for the degree of Bachelor of Science in Engineering with a major in Mechanical Engineering, students must gain major standing. An application for major standing should be submitted prior to intended enrollment in 3000- or higher level courses. Forms may be obtained from the SECS Undergraduate advising office or from the SECS website. At the time that major standing is approved, students with majors of Pre-Mechanical Engineering will have their major changed to Mechanical Engineering. Approval of both a major standing application and change of major to Mechanical Engineering is required prior to enrolling in any 3000- or higher-level courses.

To gain major standing in Mechanical Engineering, students must:

A) have an average GPA of 2.0 in the following mathematics and science courses: MTH 1554, MTH 1555, APM 2555, CHM 1430 (or CHM 1440), PHY 1610 (or PHY 1510), PHY 1620 (or PHY 1520);

B) have an average GPA of 2.0 in the following engineering core courses: EGR 1200, EGR 1400, EGR 2400, EGR 2500, EGR 2600, EGR 2800. Note that some mechanical engineering courses require a minimum grade of C in EGR 2500 or EGR 2800;

C) have no more than two grades below C in the required courses in A and B above;

D) have not attempted any course listed in A and B above more than three times; and

E) have not repeated more than three different courses listed in A and B. Courses in which a W (withdrawal) grade is recorded will not be counted.

Conditional major standing may be granted in the semester in which the student will complete the courses listed in A and B above.

Performance requirements

Satisfactory completion of the program requires a GPA of at least 2.0 within each course group: mathematics and sciences, engineering core, and professional courses (including required professional subjects and professional electives) and a grade of C or better in the senior design capstone course (ME 4999 or ME 4998). Within professional courses, at most two grades below C are permitted, at most two different courses may be repeated, and a total of three repeat attempts per course are permitted.

Mechanical Engineering, B.S.E., Specialization in Energy

The Mechanical Engineering Department offers optional specializations in Automotive Engineering, Manufacturing, and Energy to students interested in broadening their knowledge in a specific area of mechanical engineering and wishing an area of specialization in their degree. Specializations are

available to, but not required of, any student enrolled in the Bachelor of Science degree in Mechanical Engineering. The sequences of courses listed below for each specialization are taken to satisfy the professional electives requirement. Note that completing the Bachelor of Science degree in Mechanical Engineering with a specialization may require more than 128 credits. Students may earn only one specialization and the specialization must be completed as part of their degree. The specialization will be noted on the students' transcript and diploma.

See Mechanical Engineering, B.S.E. and advisor for complete details on specialization.

Energy Specialization

The Energy Specialization includes fundamental courses in energy systems as well as fundamental courses in the fluid and thermal sciences. To earn a Bachelor of Science degree in Mechanical Engineering with a specialization in Energy, students must complete the following sequence of courses to satisfy their professional electives requirement. Please note that completing this specialization may require more than 128 credits.

Required fundamental subjects - 8 credits

- ME 4510 - Intermediate Fluid Mechanics (4) or ME 4520 - Intermediate Heat Transfer (4)
- ME 4530 - Alternative Energy Systems (4)

Select at least 8 credits from the following

- ME 4510 - Intermediate Fluid Mechanics (4) if not taken as a required fundamental subject
- ME 4520 - Intermediate Heat Transfer (4) if not taken as a required fundamental subject
- ME 4535 - Introduction to Electric Drive Vehicle Engineering (4)
- ME 4540 - Internal Combustion Engines I (4)
- ME 4550 - Fluid and Thermal Systems Design (4)
- ME 4580 - Fundamentals of Nuclear Engineering (3)
- ME 4585 - Nuclear Reactors and Power Plants (3)
- ME 4900 - Special Topics (2 TO 4) with prior approval
- ME 4996 - Independent Study (1 TO 4) with prior approval
- ME 5900 - Special Topics (2 TO 4) with prior approval
- ME 5560 - Combustion Processes (4) with prior approval

- PHY 3180 - Nuclear Physics Laboratory (2) (requires ME 4580 (3) as a pre- or co-requisite)

Major Standing

To enroll in 3000- or higher level courses and to become candidates for the degree of Bachelor of Science in Engineering with a major in Mechanical Engineering, students must gain major standing. An application for major standing should be submitted prior to intended enrollment in 3000- or higher level courses. Forms may be obtained from the SECS Undergraduate advising office or from the SECS website. At the time that major standing is approved, students with majors of Pre-Mechanical Engineering will have their major changed to Mechanical Engineering. Approval of both a major standing application and change of major to Mechanical Engineering is required prior to enrolling in any 3000- or higher-level courses.

To gain major standing in Mechanical Engineering, students must:

A) have an average GPA of 2.0 in the following mathematics and science courses: MTH 1554, MTH 1555, APM 2555, CHM 1430 (or CHM 1440), PHY 1610 (or PHY 1510), PHY 1620 (or PHY 1520);

B) have an average GPA of 2.0 in the following engineering core courses: EGR 1200, EGR 1400, EGR 2400, EGR 2500, EGR 2600, EGR 2800. Note that some mechanical engineering courses require a minimum grade of C in EGR 2500 or EGR 2800;

C) have no more than two grades below C in the required courses in A and B above;

D) have not attempted any course listed in A and B above more than three times; and

E) have not repeated more than three different courses listed in A and B. Courses in which a W (withdrawal) grade is recorded will not be counted.

Conditional major standing may be granted in the semester in which the student will complete the courses listed in A and B above.

Performance requirements

Satisfactory completion of the program requires a GPA of at least 2.0 within each course group: mathematics and sciences, engineering core, and professional courses (including required professional subjects and professional electives) and a grade of C or better in the senior design capstone course (ME 4999 or ME 4998). Within professional courses, at most two grades below C are permitted, at most two different courses may be repeated, and a total of three repeat attempts per course are permitted.

Mechanical Engineering, B.S.E., Specialization in Manufacturing

The Mechanical Engineering Department offers optional specializations in Automotive Engineering, Manufacturing, and Energy to students interested in broadening their knowledge in a specific area of mechanical engineering and wishing an area of specialization in their degree. Specializations are available to, but not required of, any student enrolled in the Bachelor of Science degree in Mechanical Engineering. The sequences of courses listed below for each specialization are taken to satisfy the professional electives requirement. Note that completing the Bachelor of Science degree in Mechanical Engineering with a specialization may require more than 128 credits. Students may earn only one specialization and the specialization must be completed as part of their degree. The specialization will be noted on the students' transcript and diploma.

See Mechanical Engineering, B.S.E. and advisor for complete details on specialization.

Manufacturing Specialization

The Manufacturing Specialization includes courses related to manufacturing processes for metals and plastics as well as manufacturing systems. To earn a Bachelor of Science degree in Mechanical Engineering with a specialization in Manufacturing, students must complete the following sequence of courses to satisfy their professional electives requirement. Please note that completing this specialization may require more than 128 credits.

Required fundamental subjects - 12 credits

- ME 4360 - Mechanical Computer-Aided Manufacturing (4)
- ME 4600 - Materials Properties and Processes (4)
- ME 4700 - Manufacturing Processes (4)

Select at least 4 credits from the following

- ECE 4400 - Automatic Control Systems (4)
- ISE 4485 - Statistical Quality Analysis (4)
- ME 4710 - Flexible and Lean Manufacturing Systems (4)
- ME 4740 - Robotic Systems (4)
- ME 4750 - Optical Measurement and Quality Inspection (4)
- ME 4900 - Special Topics (2 TO 4) with prior approval
- ME 5900 - Special Topics (2 TO 4) with prior approval
- ME 5700 - Polymer Processing (4)

Major Standing

To enroll in 3000- or higher level courses and to become candidates for the degree of Bachelor of Science in Engineering with a major in Mechanical Engineering, students must gain major standing. An application for major standing should be submitted prior to intended enrollment in 3000- or higher level courses. Forms may be obtained from the SECS Undergraduate advising office or from the SECS website. At the time that major standing is approved, students with majors of Pre-Mechanical Engineering will have their major changed to Mechanical Engineering. Approval of both a major standing application and change of major to Mechanical Engineering is required prior to enrolling in any 3000- or higher-level courses.

To gain major standing in Mechanical Engineering, students must:

A) have an average GPA of 2.0 in the following mathematics and science courses: MTH 1554, MTH 1555, APM 2555, CHM 1430 (or CHM 1440), PHY 1610 (or PHY 1510), PHY 1620 (or PHY 1520).

B) have an average GPA of 2.0 in the following engineering core courses: EGR 1200, EGR 1400, EGR 2400, EGR 2500, EGR 2600, EGR 2800. Note that some mechanical engineering courses require a minimum grade of C in EGR 2500 or EGR 2800.

C) have no more than two grades below C in the required courses in A and B above;

D) have not attempted any course listed in A and B above more than three times; and

E) have not repeated more than three different courses listed in A and B. Courses in which a W (withdrawal) grade is recorded will not be counted.

Conditional major standing may be granted in the semester in which the student will complete the courses listed in A and B above.

Performance requirements

Satisfactory completion of the program requires a GPA of at least 2.0 within each course group: mathematics and sciences, engineering core, and professional courses (including required professional subjects and professional electives) and a grade of C or better in the senior design capstone course (ME 4999 or ME 4998). Within professional courses, at most two grades below C are permitted, at most two different courses may be repeated, and a total of three repeat attempts per course are permitted.

Engineering Chemistry, B.S.

Requirements for the major in engineering chemistry, B.S. program

Coordinators: Daniel DelVescovo (SECS), Jennifer Tillinger (Chemistry)

The program in engineering chemistry, which is offered by the Department of Chemistry in cooperation with the School of Engineering and Computer Science, leads to the Bachelor of Science degree with a

major in engineering chemistry. It is intended for well-qualified students who seek a basic preparation in engineering along with a highly professional chemistry program.

Students in this program are not required to complete the College of Arts and Sciences college exploratory requirements.

Course requirements (minimum of 128 total credits)

To earn the degree of Bachelor of Science with a major in engineering chemistry, students must complete a minimum of 128 credits, satisfy writing requirement (also see Undergraduate degree requirements) and meet the following requirements:

General Education

The General Education Requirements are comprised of three parts: Foundations, Explorations, and Integration. In addition, U.S. Diversity requirements must also be met. For details, refer to the General Education section of the catalog. In order to satisfy both general education and other program requirements, in some of the general education areas students should select from the courses listed below:

Foundations:

- Writing Foundations - WRT 1060
- Formal Reasoning (satisfied by MTH 1554; see Mathematics and Sciences)

Explorations: One course from each of the seven Explorations areas:

- Arts
- Language and Culture
- Global Perspective
- Literature
- Natural Science and Technology (satisfied by EGR 2400 or EGR 2500; see Engineering Core)
- Social Science
- Western Civilization (satisfied by PHL 1310; see Additional Major Requirements)

Integration:

- Knowledge Applications (satisfied by MTH 1555; see Mathematics and Sciences)
- Capstone (satisfied by ME 4999 or CHM 4996; see Required Professional Subjects)

U.S. Diversity:

- May be met by an approved course in the Explorations area

Writing Intensive:

- Writing Intensive in the Major (satisfied by ME 4999 or CHM 4996; see Required Professional Subjects)

- Writing Intensive in General Education (may be met by an approved course in the Explorations area)

Additional Major Requirements:

All engineering chemistry students must meet the following requirement. This course can meet general education exploration areas above.

- Professional Ethics: PHL 1310 - Introduction to Ethics in Science and Engineering

In order to graduate on-schedule without taking additional courses, it is highly recommended that students meet with an SECS Undergraduate Academic Adviser concerning the selection of all of their general education courses.

Mathematics and Sciences

- MTH 1554 - Calculus I (4)

- MTH 1555 - Calculus II (4)

- MTH 2554 - Multivariable Calculus (4)

- APM 2555 - Introduction to Differential Equations with Matrix Algebra (4)

- PHY 1610 - Fundamentals of Physics I (4)

- PHY 1620 - Fundamentals of Physics II (4)

- CHM 1440 - General Chemistry I (4) and CHM 1470 - General Chemistry Laboratory I (1)

- CHM 1450 - General Chemistry II (4) and CHM 1480 - General Chemistry Laboratory II (1)

Engineering Core

- EGR 1200 - Engineering Graphics and CAD (1)

- EGR 1400 - Computer Problem Solving in Engineering and Computer Science (4)

- EGR 2400 - Introduction to Electrical and Computer Engineering (4)
- EGR 2500 - Introduction to Thermal Engineering (4)
- EGR 2600 - Introduction to Industrial and Systems Engineering (4)
- EGR 2800 - Design and Analysis of Electromechanical Systems (4)

Required Professional Subjects

- CHM 2340 - Organic Chemistry I (4)
- CHM 2350 - Organic Chemistry II (4)
- CHM 2370 - Organic Chemistry Laboratory (2)
- CHM 3250 - Analytical Chemistry (4)
- CHM 3420 - Physical Chemistry I (4)
- CHM 3430 - Physical Chemistry II (4)
- CHM 3480 - Physical Chemistry Laboratory (2)
- CHM 4710 - Structure and Synthesis of Polymers (3)
- ME 3500 - Introduction to Fluid and Thermal Energy Transport (4)
- One lecture or laboratory course above CHM 4000 (3); Note: CHM 3620 may satisfy this requirement.
- ME 4999 - Senior Mechanical Engineering Design Project (4) or CHM 4996 - Independent Research (3)

Professional Electives

Students must complete a minimum of 8 credits from:

- ME 4500 - Energy Systems Analysis and Design (4)
- ME 4510 - Intermediate Fluid Mechanics (4)
- ME 4520 - Intermediate Heat Transfer (4)
- ME 4540 - Internal Combustion Engines I (4)
- ME 4550 - Fluid and Thermal Systems Design (4)

- ECE 4400 - Automatic Control Systems (4)

Major Standing

To enroll in 3000- or higher level courses and to become candidates for the degree of Bachelor of Science with a major in Engineering Chemistry, students must gain major standing in Engineering Chemistry. An application for major standing should be submitted prior to intended enrollment in 3000- or higher level courses. Forms may be obtained from the SECS Undergraduate advising office or from the SECS website. At the time that major standing is approved, students with majors of Pre-Engineering Chemistry will have their major changed to Engineering Chemistry. Approval of both a major standing application and change of major to Engineering Chemistry is required prior to enrolling in any 3000- or higher-level courses.

To gain major standing in Engineering Chemistry, students must meet the following requirements:

A) have an average GPA of 2.0 in the following mathematics and science courses: MTH 1554, MTH 1555, APM 2555, PHY 1610, PHY 1620, CHM 1440, CHM 1450, CHM 1470 and CHM 1480.

B) have an average GPA of 2.0 in the following engineering core courses: EGR 1200, EGR 1400, EGR 2400, EGR 2500, EGR 2600 and EGR 2800.

C) have no more than two grades below C in the required courses in A and B above.

D) have not attempted any course listed in A and B above more than three times.

E) have not repeated more than three different courses listed in A and B. Courses in which a W (withdrawal) grade is recorded will not be counted.

Conditional major standing may be granted in the semester in which the student will complete the courses listed in A and B above.

Performance requirements and additional general education notes

Students must complete the university's General Education Requirements, including the capstone course of either CHM 4996 or ME 4999 (see Undergraduate Degree Requirements). In addition to the previously stated requirements, satisfactory completion of the program requires an average grade of at least C in the courses taken to satisfy the engineering and chemistry requirements and in the courses prescribed for the mathematics and science requirements.

Sample Engineering Chemistry schedule

Freshman year

Fall Semester -- 18 credits

- CHM 1440 - General Chemistry I (4)

- CHM 1470 - General Chemistry Laboratory I (1)
- EGR 1200 - Engineering Graphics and CAD (1)
- EGR 1400 - Computer Problem Solving in Engineering and Computer Science (4)
- MTH 1554 - Calculus I (4)
- General Education Course (4)

Winter Semester -- 17 credits

- CHM 1450 - General Chemistry II (4)
- CHM 1480 - General Chemistry Laboratory II (1)
- MTH 1555 - Calculus II (4)
- PHY 1610 - Fundamentals of Physics I (4)
- General Education Course (4)

Sophomore year

Fall Semester -- 16 credits

- CHM 2340 - Organic Chemistry I (4)
- MTH 2554 - Multivariable Calculus (4)
- PHY 1620 - Fundamentals of Physics II (4)
- General Education Course (4)

Winter Semester -- 18 credits

- APM 2555 - Introduction to Differential Equations with Matrix Algebra (4)
- CHM 2350 - Organic Chemistry II (4)
- CHM 2370 - Organic Chemistry Laboratory (2)
- EGR 2400 - Introduction to Electrical and Computer Engineering (4)
- General Education Course (4)

Junior year

Fall Semester -- 16 credits

- CHM 3250 - Analytical Chemistry (4)
- EGR 2500 - Introduction to Thermal Engineering (4)
- EGR 2600 - Introduction to Industrial and Systems Engineering (4)
- General Education Course (4)

Winter Semester -- 16 credits

- CHM 3420 - Physical Chemistry I (4)
- EGR 2800 - Design and Analysis of Electromechanical Systems (4)
- ME 3500 - Introduction to Fluid and Thermal Energy Transport (4)
- General Education Course (4)

Senior year

Fall Semester -- 14 credits

- CHM 3430 - Physical Chemistry II (4)
- CHM 4710 - Structure and Synthesis of Polymers (3)
- CHM Lecture or Laboratory above CHM 4000 (3)
- Professional Elective (4)

Winter Semester -- 13 - 14 credits

- CHM 3480 - Physical Chemistry Laboratory (2)
- CHM 4996 - Independent Research (3) or ME 4999 - Senior Mechanical Engineering Design Project (4)
- Professional Elective (4)
- General Education Course (4)

Engineering Physics, B.S.

Requirements for the major in engineering physics, B.S. program

Coordinators: Steven Louis (SECS) with Andrei Slavin (Physics)

The program in engineering physics is offered jointly by the School of Engineering and Computer Science and the College of Arts and Sciences. This program blends the pure and applied, the theoretical and practical aspects of scientific knowledge into a meaningful educational experience. Through the university's cooperative education program, engineering physics students may opt to combine a relevant work experience with their formal education.

Course requirements (minimum of 128 total credits)

To earn the degree of Bachelor of Science with a major in engineering physics, students must complete a minimum of 128 credits, demonstrate writing proficiency (see Undergraduate degree requirements) and meet the following requirements:

General education

The General Education Requirements are comprised of three parts: Foundations, Explorations, and Integration. In addition, U.S. Diversity requirements must also be met. For details, refer to the General Education section of the catalog. In order to satisfy both general education and other program requirements, in some of the general education areas students should select from the courses listed below:

Foundations:

- Writing Foundations - WRT 1060
- Formal Reasoning (satisfied by MTH 1554; see Mathematics and Sciences)
- Explorations: One course from each of the seven Explorations areas:

Arts:

- Language and Culture
- Global Perspective
- Literature
- Natural Science and Technology (satisfied by EGR 2400 or EGR 2500; see Engineering Core)
- Social Science (satisfied by ECN 1500, ECN 2010, or ECN 2020; see Additional Major Requirements)
- Western Civilization (satisfied by PHL 1310; see Additional Major Requirements)

Integration:

- Knowledge Applications (satisfied by MTH 1555; see Mathematics and Sciences)
- Capstone (satisfied by PHY 4995; see Required Professional Subjects)

U.S. Diversity:

- May be met by an approved course in the Explorations area
- Writing Intensive:
- Writing Intensive in the Major (satisfied by ME 4999; see Required Professional Subjects)
- Writing Intensive in General Education (may be met by an approved course in the Explorations area)

Additional Major Requirements:

All engineering physics students must meet the following requirement. This course can meet general education exploration areas above.

- Professional Ethics: PHY 1310 - Physics in Medicine

In order to graduate on-schedule without taking additional courses, it is highly recommended that students meet with an SECS Undergraduate Academic Adviser concerning the selection of all of their general education courses.

Mathematics and sciences

- MTH 1554 - Calculus I (4)
- MTH 1555 - Calculus II (4)
- MTH 2554 - Multivariable Calculus (4)
- APM 2555 - Introduction to Differential Equations with Matrix Algebra (4)
- CHM 1430 - Chemical Principles (4) or [CHM 1440 (4) and CHM 1470 (1)]
- PHY 1510 - Introductory Physics I (4) and PHY 1100 - General Physics Lab I (1)
- PHY 1520 - Introductory Physics II (4) and PHY 1110 - General Physics Lab II (1)
- PHY 3170 - Modern Physics Laboratory (2)
- PHY 3510 - Intermediate Theoretical Physics (4)

- PHY 3610 - Mechanics I (4)
- PHY 3710 - Foundations of Modern Physics (4)
- One additional elective from the list below:

Approved elective options:

- PHY 3310 - Optics (4)
- PHY 3660 - Vibrations and Waves (4)
- PHY 3810 - Electricity and Magnetism (4)
- PHY 4720 - Quantum Mechanics I (4)

Engineering Core

- EGR 1200 - Engineering Graphics and CAD (1)
- EGR 1400 - Computer Problem Solving in Engineering and Computer Science (4)
- EGR 2400 - Introduction to Electrical and Computer Engineering (4)
- EGR 2500 - Introduction to Thermal Engineering (4)
- EGR 2600 - Introduction to Industrial and Systems Engineering (4)
- EGR 2800 - Design and Analysis of Electromechanical Systems (4)

Required Professional Subjects

- ECE 2005 - Electric Circuits (4)
- ECE 3100 - Electronic Circuits and Devices I (4)
- PHY 4995 - Independent Research (3 TO 6)

Professional Electives

Engineering Physics students must complete one of the two depth areas below for a minimum of 12 credits. For the depth areas, students must complete the two required courses and must select one course from the design electives. Students with different interests can construct different depth areas in consultation with the program coordinators, and via the SECS Petition of Exception process. Students must also complete 8 additional professional elective credits selected from the Technical Electives area.

1. Solid state physics and technology depth area

- ECE 4130 - Electronic Materials and Devices (4)
- PHY 4720 - Quantum Mechanics I (4)

Choose one design elective course from the list below

- ECE 4135 - Integrated Electronics (4)
- ECE 4210 - Communication Systems (4)
- ECE 4710 - Computer Hardware Design (4)

2. Applied mechanics depth area

- PHY 3660 - Vibrations and Waves (4)
- ME 3200 - Engineering Mechanics (4) (or ME 3250 (4))

Choose one design elective course from the list below

- ME 4500 - Energy Systems Analysis and Design (4)
- ME 4210 - Analysis and Design of Mechanical Structures (4)
- ME 4550 - Fluid and Thermal Systems Design (4)
- ME 4300 - Mechanical Systems Design (4)
- ME 4350 - Mechanical Computer-Aided Engineering (4)

Technical electives, choose 8 credits from

- MTH 2775 - Linear Algebra (4)
- APM 2663 - Discrete Mathematics (4)
- PHY 3180 - Nuclear Physics Laboratory (2)
- PHY 3310 - Optics (4)
- PHY 3660 - Vibrations and Waves (4)
- PHY 3720 - Nuclear Physics (4)
- PHY 3810 - Electricity and Magnetism (4)
- PHY 4180 - Modern Optics Laboratory (2)

- PHY 4720 - Quantum Mechanics I (4)
- PHY 4820 - Electricity and Magnetism II (4)
- ECE 4710 - Computer Hardware Design (4)
- ME 3500 - Introduction to Fluid and Thermal Energy Transport (4)
- ME 3250 - Mechanics of Materials (4)
- Any 4000-level ECE, ME or ISE courses (4-8)

Major Standing

To enroll in 3000- or higher level courses and to become candidates for the degree of Bachelor of Science with a major in Engineering Physics, students must gain major standing in Engineering Physics. An application for major standing should be submitted prior to intended enrollment in 3000- or higher level courses. Forms may be obtained from the SECS Undergraduate advising office or from the SECS website. At the time that major standing is approved, students with majors of Pre-Engineering Physics will have their major changed to Engineering Physics. Approval of both a major standing application and change of major to Engineering Physics is required prior to enrolling in any 3000- or higher-level courses.

To gain major standing in Engineering Physics, students must meet the following requirements:

A) have an average GPA of 2.0 in the following mathematics and science courses: MTH 1554, MTH 1555, APM 2555, CHM 1430, PHY 1510, PHY 1100, PHY 1520 and PHY 1110.

B) have an average GPA of 2.0 in the following engineering core courses: EGR 1200, EGR 1400, EGR 2400, EGR 2500, EGR 2600 and EGR 2800.

C) have no more than two grades below C in the required courses in A and B above.

D) have not attempted any course listed in A and B above more than three times.

E) have not repeated more than three different courses listed in A and B. Courses in which a W (withdrawal) grade is recorded will not be counted.

Conditional major standing may be granted in the semester in which the student will complete the courses listed in A and B above.

Performance Requirements and Additional General Education Notes

Satisfactory completion of the program requires an average grade of C within each course group: mathematics and sciences, engineering core, and professional courses (including required professional subjects and professional depth areas). Within professional courses, at most two grades below C are permitted, at most two different courses may be repeated and a total of three attempts are permitted.

Students in this program are not required to complete the college distribution requirement of the College of Arts and Sciences.

Sample Engineering Physics schedule

Freshman Year

Fall Semester - 17 credits

- MTH 1554 - Calculus I (4)
- EGR 1200 - Engineering Graphics and CAD (1)
- EGR 1400 - Computer Problem Solving in Engineering and Computer Science (4)
- CHM 1430 - Chemical Principles (4)
- General Education Course (4)

Winter Semester - 17 credits

- MTH 1555 - Calculus II (4)
- PHY 1510 - Introductory Physics I (4)
- PHY 1100 - General Physics Lab I (1)
- EGR 2400 - Introduction to Electrical and Computer Engineering (4)
- General Education Course (4)

Sophomore year

Fall Semester - 17 credits

- MTH 2554 - Multivariable Calculus (4)
- PHY 1520 - Introductory Physics II (4)
- PHY 1110 - General Physics Lab II (1)
- EGR 2600 - Introduction to Industrial and Systems Engineering (4)
- General Education Course (4)

Winter Semester - 16 credits

- APM 2555 - Introduction to Differential Equations with Matrix Algebra (4)
- ECE 2005 - Electric Circuits (4)
- EGR 2500 - Introduction to Thermal Engineering (4)
- General Education Course (4)

Junior year

Fall Semester - 14 credits

- EGR 2800 - Design and Analysis of Electromechanical Systems (4)
- PHY 3170 - Modern Physics Laboratory (2)
- PHY 3710 - Foundations of Modern Physics (4)
- General Education Course (4)

Winter Semester - 16 credits

- ECE 3100 - Electronic Circuits and Devices I (4)
- PHY 3310, PHY 3810, or PHY 4720 (4)
- Professional Elective (4)
- General Education Course (4)

Senior year

Fall Semester -- 16 credits

- PHY 3510 - Intermediate Theoretical Physics (4)
- PHY 3610 - Mechanics I (4)
- Technical Elective (4)
- General Education (4)

Winter Semester - 16 credits

- Technical Elective (4)
- Professional Elective (4)

- Professional Elective (4)
- PHY 4995 - Independent Research (4)

International Orientation for Engineering/Computer Science Students Minor

To obtain a minor in international orientation for engineering/computer science students, students must complete the following courses with an average GPA of 2.0 in each course:

Requirements

- ECN 2000 - Principles of Macroeconomics (4) or ECN 2020 - Principles of Global Macroeconomics (4)
- Foreign language consistent with the introductory course (8)
- One advanced course (4 credits) from PS 3040 or ECN 3730
- EGR 4910 (4), which requires eight weeks of study/work abroad

Introductory course – 4 credits

- IS 2100 - Perspectives on China (4)
- IS 2200 - Perspectives on Japan (4)
- IS 2300 - Perspectives on Africa (4)
- IS 2400 - Perspectives on India (4)
- IS 2500 - Perspectives on Latin America (4)
- IS 2600 - Perspectives on Russia and Eastern Europe (4)
- HST 3400 - Europe since 1914 (4)

Additional Information

Some of the courses listed above also satisfy general education requirements. This minor is open to the students in the School of Engineering and Computer Science.

School of Nursing (SON)

BSN Accelerated Second-Degree (Pre-Licensure)

Requirements for the Bachelor of Science in Nursing - BSN Degree: ASD Track

Students must satisfy the following:

1. Complete all academic requirements identified in the SON plan of study.

2. Satisfy the OU residency requirement.

3. Complete at least 32 credits at or above the 3000-level.Accelerated Second-Degree BSN Track

Semester 1 (18 credits)

- BIO 3520 - Introduction to Human Microbiology (4) or CDS 3300 - Microbiology of Infectious Diseases(3) and CDS 3310 - Microbiology of Infectious Diseases Laboratory(1) (The School of Nursing reserves the right to apply credits from OU and/or courses taken at other institutions to meet this requirement)

- NRS 2010 - Pathophysiology (3)

- NRS 2012 - Introduction to Professional Nursing (3)

- NRS 2014 - Health Assessment (4)

- PSY 2250 - Introduction to Life-Span Developmental Psychology (4) (The School of Nursing reserves the right to apply credits from OU and/or courses taken at other institutions to meet this requirement)

Semester 2 (17 credits)

- NRS 2020 - Pharmacology (4)

- NRS 2024 - Fundamentals of Professional Nursing Practice (5)

- NRS 3012 - Research for Evidence-Based Nursing Practice (3)

- NRS 3015 - Nursing Care of Adults I (5)

Semester 3 (17 credits)

- NRS 3022 - Informatics for Nursing Practice (2)
- NRS 3016 - Nursing Care of Individuals with Behavioral and Mental Health Disorders (5)
- NRS 3025 - Nursing Care of Adults II (5)
- NRS 3026 - Nursing Care of the Childbearing Family (5)

Semester 4 (17 credits)

- NRS 4012 - Nursing Leadership (2)
- NRS 4015 - Nursing Care of Communities and Populations (5)
- NRS 4016 - Nursing Care of the Childrearing Family (5)
- NRS 4026 - Nursing Capstone (5)

69 Total Credits

BSN Basic (Pre-Licensure)

Requirements for the Bachelor of Science in Nursing - BSN Degree: Basic Track (Pre-Licensure)

Students must complete 125 credits and satisfy the following:

1. Complete all academic requirements identified in the SON plan of study.

2. Satisfy the general education requirements.

3. Complete at least 32 credits at or above the 3000-level.

Pre-nursing Semester 1 (16 credits)

- BIO 1200 - Biology I (4)
- CHM 1040 - Introduction to Chemical Principles (4)
- PSY 1000 - Introduction to Psychology (4)

- WRT 1050 - Composition I (4)

Pre-nursing Semester 2 (17 credits)

- BIO 2006 - Clinical Anatomy and Physiology (5)
- CHM 2010 - Introduction to Organic and Biological Chemistry (4)
- WRT 1060 - Composition II (4)
- (Select one) PHL 1000, PHL 1070, PHL 1100, PHL 1300, PHL 2200, PHL 2210, PHL 2220 (4)

Nursing Year 1

Semester 1 (14 credits)

- BIO 3520 - Introduction to Human Microbiology (4) or CDS 3300 - Microbiology of Infectious Diseases (3) and CDS 3310 - Microbiology of Infectious Diseases Laboratory (1)
- NRS 2010 - Pathophysiology (3)
- NRS 2012 - Introduction to Professional Nursing (3)
- NRS 2014 - Health Assessment (0 OR 4)

Semester 2 (17 credits)

- NRS 2020 - Pharmacology (4)
- NRS 2024 - Fundamentals of Professional Nursing Practice (5)
- PSY 2250 - Introduction to Life-Span Developmental Psychology (4)
- General Education course (4)

Nursing Year 2

Semester 1 (17 credits)

- NRS 3012 - Research for Evidence-Based Nursing Practice (3)
- NRS 3015 - Nursing Care of Adults I (5)
- NRS 3016 - Nursing Care of Individuals with Behavioral and Mental Health Disorders (5)
- General Education course (4)

Semester 2 (16 credits)

- NRS 3022 - Informatics for Nursing Practice (2)
- NRS 3025 - Nursing Care of Adults II (5)
- NRS 3026 - Nursing Care of the Childbearing Family (5)
- General Education course (4)

Nursing Year 3

Semester 1 (16 credits)

- NRS 4012 - Nursing Leadership (2)
- NRS 4015 - Nursing Care of Communities and Populations (5)
- NRS 4016 - Nursing Care of the Childrearing Family (5)
- General Education course (4)

Semester 2 (12 credits)

- NRS 4026 - Nursing Capstone (5)
- NRS XXXX - Nursing Elective (3)
- General Education course (4)

125 Total Credits

Note

Writing Intensive in General Education: Recommend Global Perspectives that also meets Writing Intensive in General Education.

General Education: Students choose one approved course from each of the following categories: Arts; Foreign Language and Culture; Formal Reasoning; Global Perspective; Literature; Natural Science and Technology; Social Science; Western Civilization; Writing Intensive in the General Education. Students are encouraged to consult with an academic adviser for assistance selecting and scheduling general education courses and in particular the course selected to fulfill the Writing Intensive in the General Education within their academic schedule. In many instances, you may select one course to fulfill more than one degree requirement.

BSN Degree Completion Sequence (RN-BSN, Post-Licensure)

Requirements for the Bachelor of Science in Nursing - BSN Degree: BSN Degree Completion Sequence (RN-BSN) Track for Registered Nurses

Students must complete all academic requirements identified in the SON plan of study.

Full-Time

Semester 1 (14 credits)

- NRS 3511 - Transition to Baccalaureate Nursing Education (4)
- NRS 4551 - Population Health (4)
- NRS 3022 - Informatics for Nursing Practice (2)
- NRS 4561 - Community and Global Health (4)

Semester 2 (14 credits)

- NRS 3071 - Research Basis of Nursing Practice (4)
- NRS 3541 - Nursing Leadership and Health Care Issues (3)
- NRS 4571 - Contemporary Nursing: Professional and Ethical Issues (4)
- NRS XXXX - Nursing Elective (3)

Semester 3 (4 credits)

- NRS 4585 - Nursing Capstone Experience (4)

Part-Time

Semester 1 (6 credits)

- NRS 3511 - Transition to Baccalaureate Nursing Education (4)
- NRS 3022 - Informatics for Nursing Practice (2)

Semester 2 (7 credits)

- NRS 3071 - Research Basis of Nursing Practice (4)
- NRS XXXX - Nursing Elective (3)

Semester 3 (8 credits)

- NRS 4551 - Population Health (4)
- NRS 4561 - Community and Global Health (4)

Semester 4 (7 credits)

- NRS 3541 - Nursing Leadership and Health Care Issues (3)
- NRS 4571 - Contemporary Nursing: Professional and Ethical Issues (4)

Semester 5 (4 credits)

- NRS 4585 - Nursing Capstone Experience (4)

32 Total Nursing Credits

University Transfer policy

Students admitted to OU SON from a regionally accredited Associate's Degree in Nursing Program (ADN), may transfer a maximum of 63 credits as established by the university transfer policy. Students transferring in without the completion of the Michigan Transfer Agreement, please reference the general education transfer guide for courses that satisfy individual categories.

Additional 30 Prior Learning credits

Oakland University awards an additional 30 prior learning credits awarded for successful completion of the NCLEX-RN.

Wellness and Health Promotion, B.S. to Accelerated Second Degree BSN Pathway

The School of Health Sciences (SHS) and the School of Nursing (SON) have partnered to create the Wellness and Health Promotion (WHP) to Accelerated Second-Degree (ASD) Bachelor of Science in

Nursing (BSN) pathway. This pathway is for first-time Pre-Nursing freshman students who did not gain admission to the Basic BSN program after their first year of study. Up to five pre-nursing students will be offered automatic admission to the ASD program through the WHP-ASD pathway. Students on the WHP-ASD pathway must meet all of the following requirements to gain admission into the SON's ASD BSN track in the semester following degree attainment:

1. Completion of all nursing prerequisites in the first year of study with a minimum grade of Bin each course and with no repeated coursework. These courses include BIO 1200, BIO 2006, CHM 1040, CHM 2010, PSY 1000, PHY 1100 (1000 or 1300 also accepted), and WRT 1060.

2. A combined grade point average of 3.2 or higher in BIO 1200, BIO 2006, CHM 1040, CHM 2010, and PSY 1000.

3. Completion of the B.S. in WHP with a 3.0 cumulative grade point average or higher.

4. No repeated courses in the B.S. in WHP.

5. Completion of CDS 3300 and CDS 3310 or BIO 3520, with a minimum grade of C.

6. Completion of PSY 2250 with a minimum grade of B-.

7. Adherence to Oakland University's undergraduate admission requirements for second-degree students, including the completion of a second-degree application through Undergraduate Admissions.